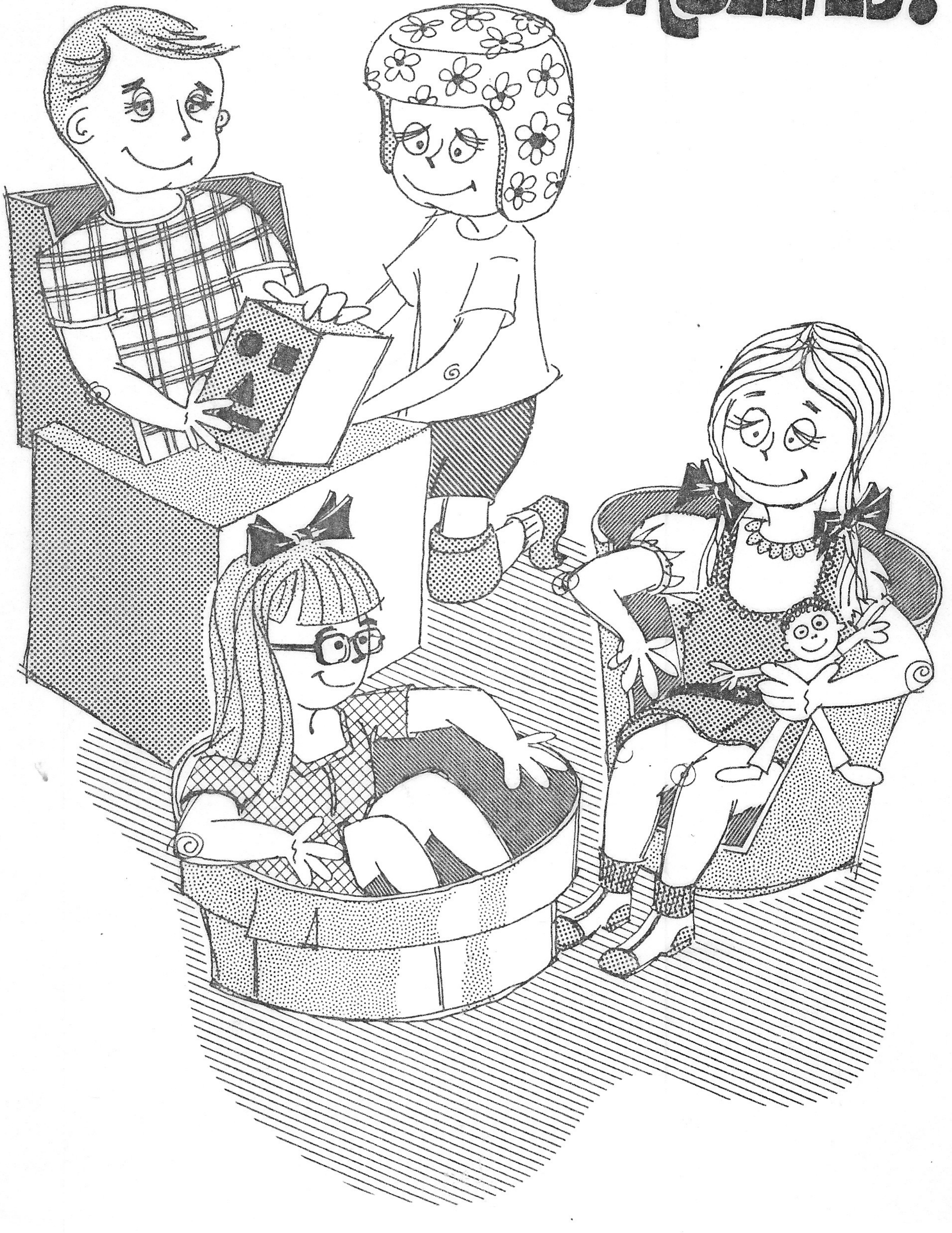
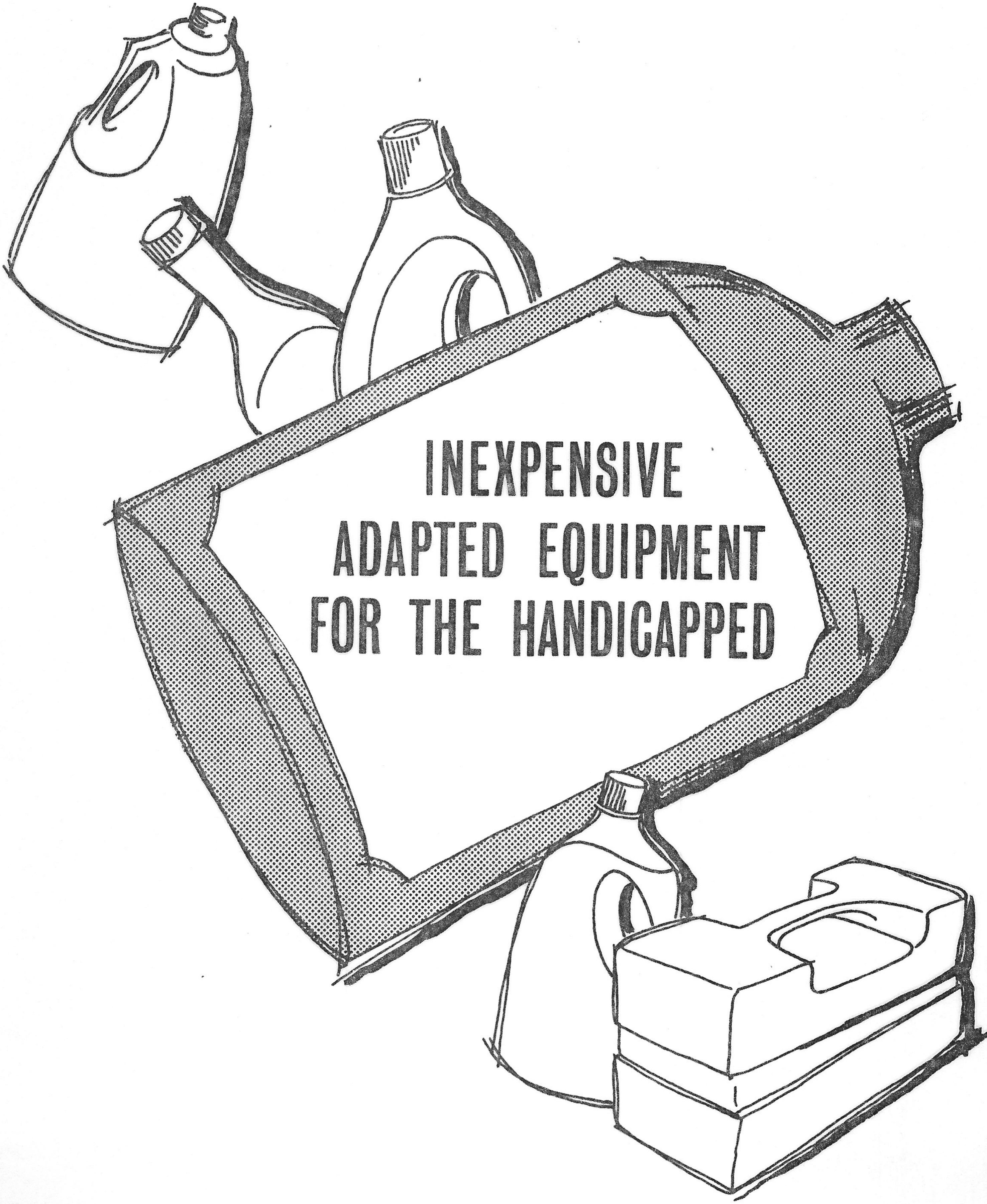
OT Department

PLEASE HELP US HELP OURSELVES!





INEXPENSIVE ADAPTED EQUIPMENT FOR THE HANDICAPPED

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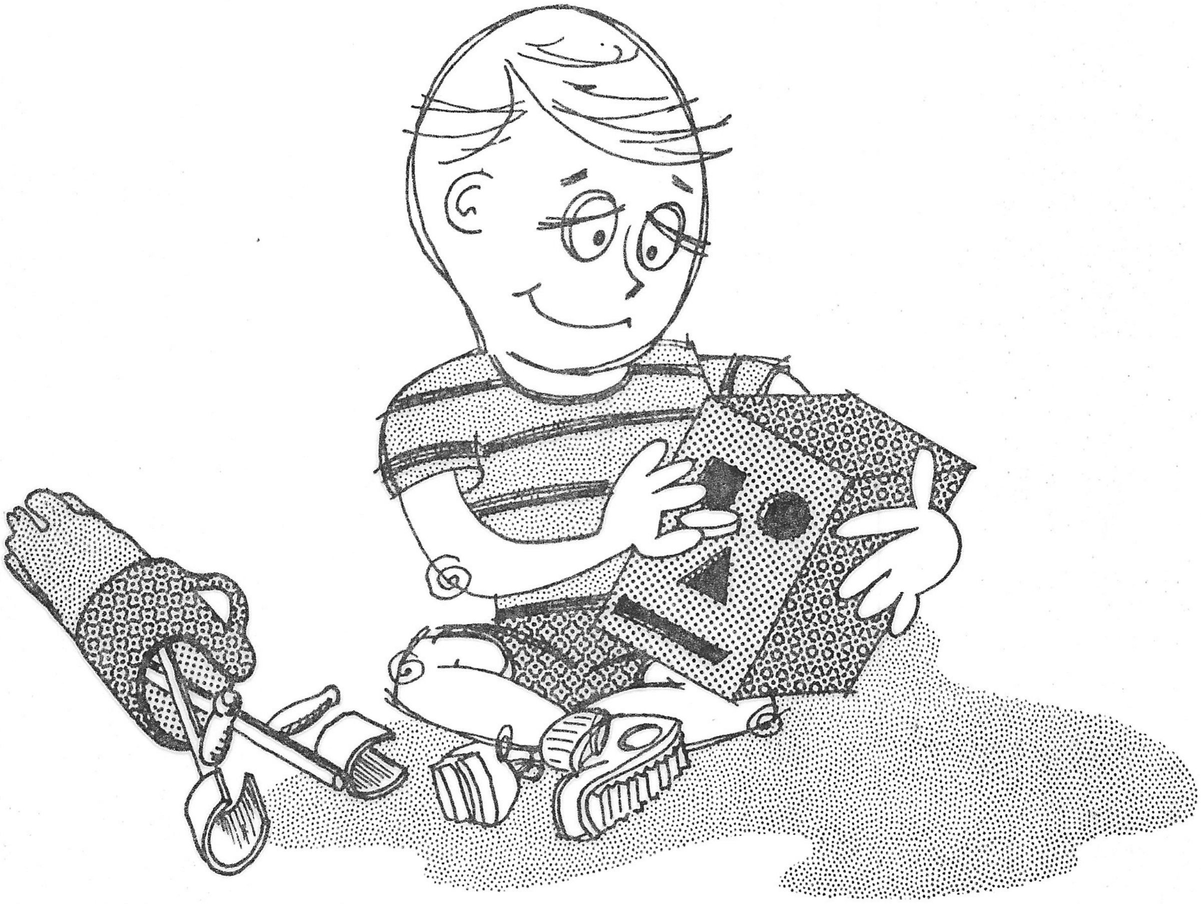
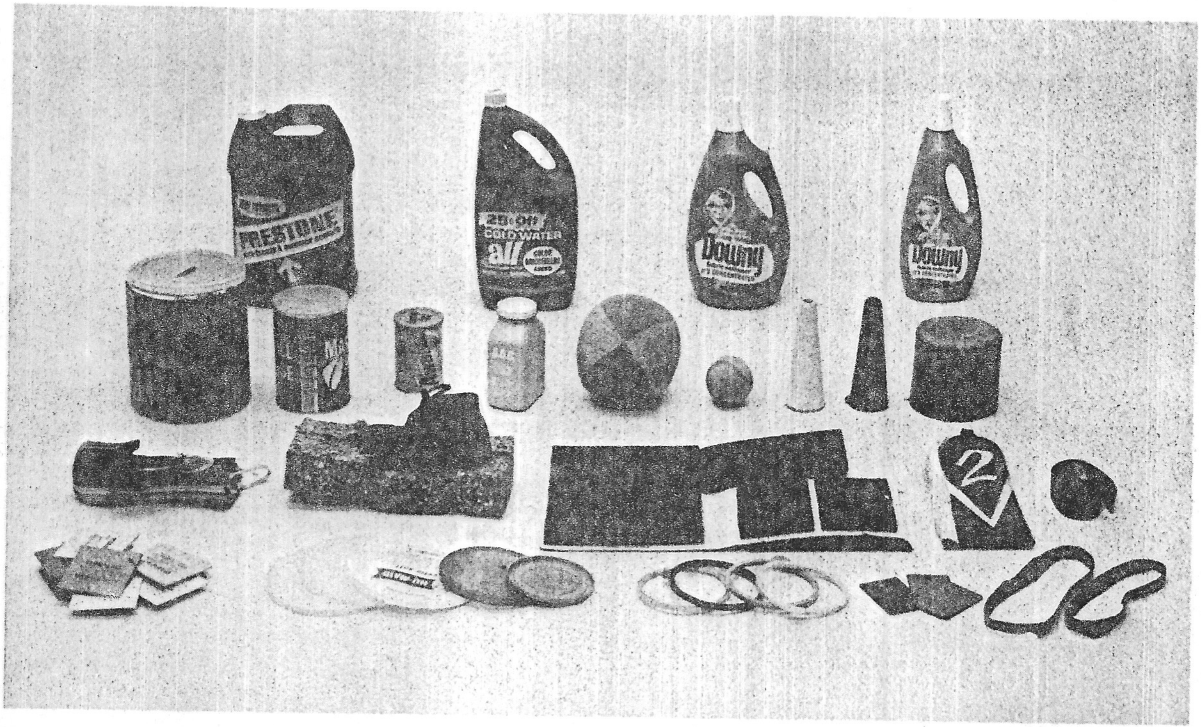


This manual was developed to illustrate the fabrication and easily-made, inexpensive adaptive equipment for the handicapped child. A Department of Health, Education and Welfare, Maternal and Child Health Service grant sponsored this manual and a seminar. Miss Carol Nathan, A.M., O.T.R., was Project Director.

A "Seminar on Adapted Equipment for the Handicapped Child" was held March 9 to 13, 1970, in the Occupational Therapy Department at Indiana University Medical Center, Indianapolis, Indiana. The seminar was conducted by Miss Anita Slominski, O.T.R., Coordinator of the Cerebral Palsy Clinic, and Miss Patricia Griswold, O.T.R., Supervisor of Occupational Therapy, Cerebral Palsy Clinic, Indiana University Medical Center, Indianapolis, Indiana.

Art work and photographs courtesy Illustration Department, Indiana University Medical Center.

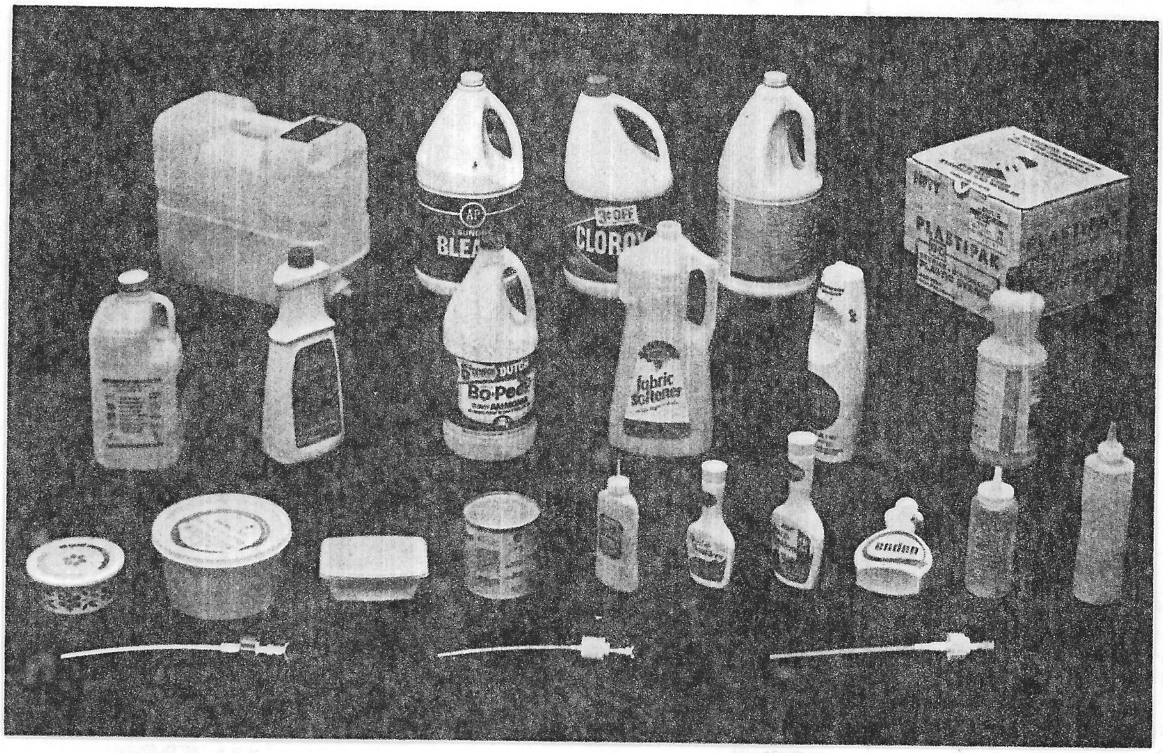


Row 1 - Linoleum samples - squares, assorted plastic round lids, assorted plastic rings, rectangle wood finish samples, inner tube black elastic bands.

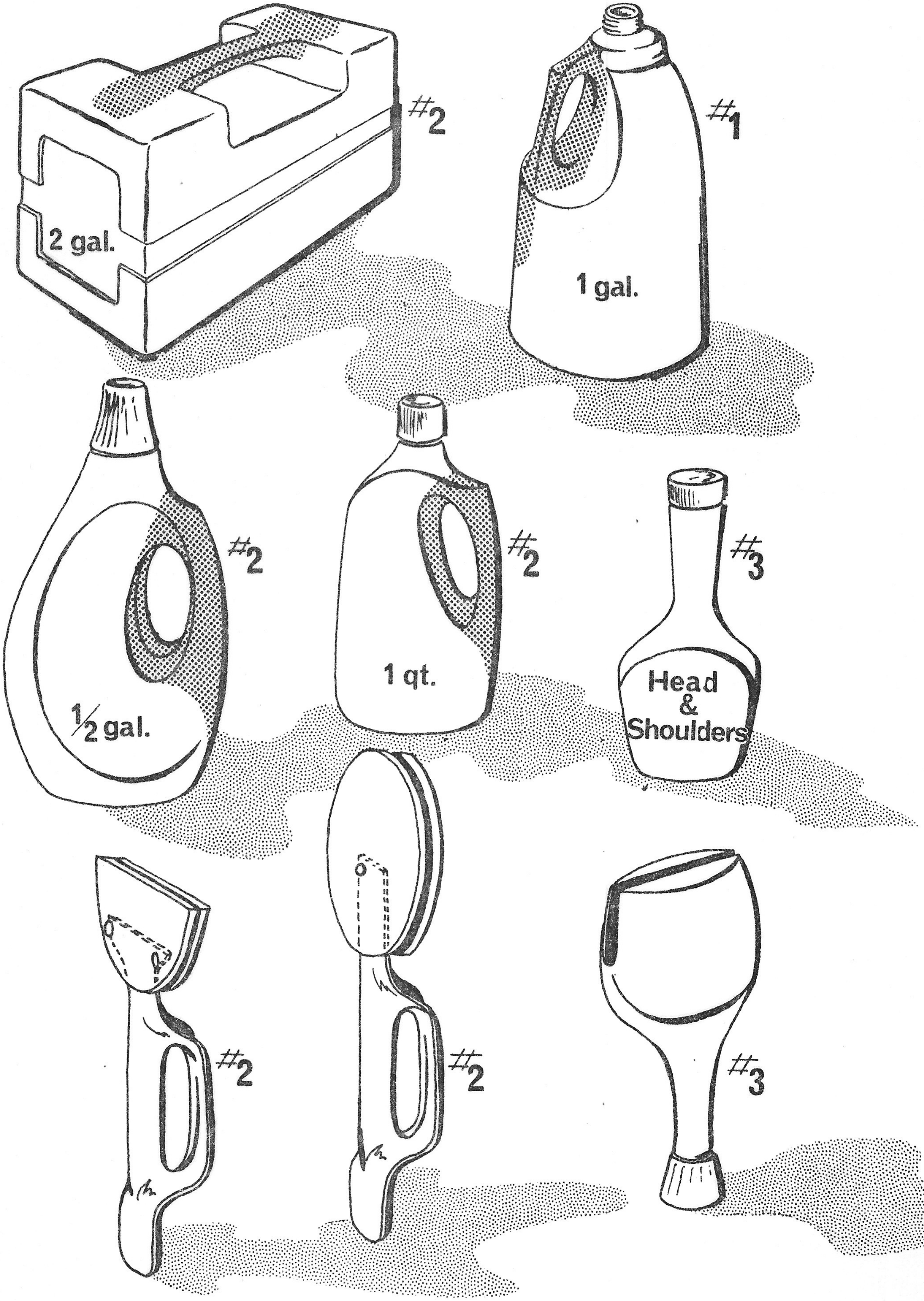
Row 2 - Old tennis shoe, plastic foam for balance, rug samples (no fibre glass), golf mit cover, army belt (or scout belt).

Row 3 - 2 lb. coffee or shortening can, 1 lb. cylinder can (coffee), 9 oz. cylinder can, 1 pt. rectangular bottle, scrap material ball stuffed with nylon shredded stockings, tennis ball, thread cones, sponge plastic cylinder (used for balance or toss games).

Row 4 - 1 gal. wide handle grip oval base (shoe stablizer), 1 gal. wide curved handle square base - cast or shoe stablizer, 1 gal. wide handle - base used for shoe heel stirrup, 1 qt. wide handle, oval base used for deflector or toe cover.



Row 1 - Hard plastic dispenser tubes become hard plastic straws.
Row 2 - Round pint tub, round quart tub, rectangular pint tub, aluminum cylinder - Pillsbury frosting, hair color squirt screw spout, 3 oz. Head & Shoulders - pistol grip, 6 oz. Head & Shoulders - pistol grip, 9 oz. Enden - for wide grasp, 7 oz. Lady Clariol - screw spout, 12 oz. Suave set - screw spout.
Row 3 - Square gal. with 2 finger grip, 1 qt. oval shaped base, 2 qt. curved handle, 2 qt. square handle, 2 lb. Bowlene 1 qt. round cylinder bottle.
Row 4 - 2 1/2 gal. self dispensing liquid - (milk), 1 gal. curved handle, 1 gal. curved handle, 1 gal. square handle, cube shaped box for hide & seek.

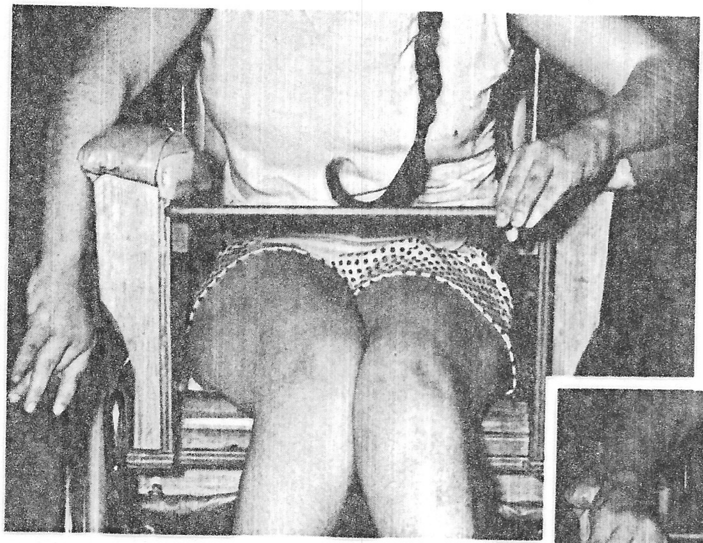

2 gal.
#2
#1
1 gal.
#2
½ gal.
#2
1 qt.
#3
Head & Shoulders
#2
#2
#3

THIGH AND WRIST CUFF PATTERN (For stabilizing extremities)

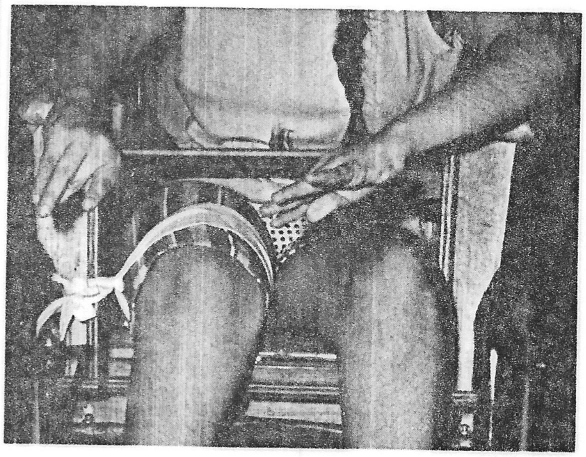
Cut pattern on fold; place opened pattern with fold crease opposite handle on plastic bottle. Trace around pattern; submerge bottle in very hot water. Cut with ordinary scissors (plastic bottle handle saved for utensil holder).
Add 5/8" to opened pattern for cloth cover. For cover casing use denim or Indian head material.
Prepare tieing straps - double material and stitch all sides to prevent raveling. Sew straps with double seams at X on the outside material before sewing casing together. Child's wrist strap should be 1" x 12" long when finished. Child's thigh strap finished is 1" x 18" long.

Wrap cuff around limb, tie slip knot then tie strap to lapboard, wheelchair, etc. for stabilization of extremity.

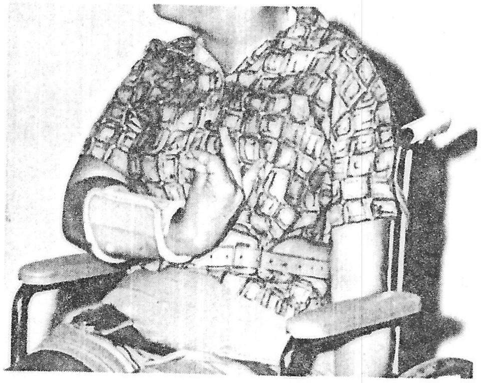
THIGH AND WRIST CUFF



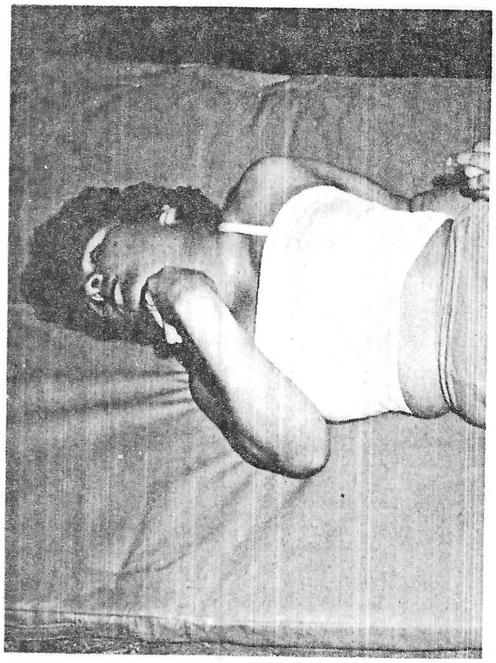
A. Tension Athetoid,
age 16.



B. Abduction of thigh with
stabilizing plastic cuff.

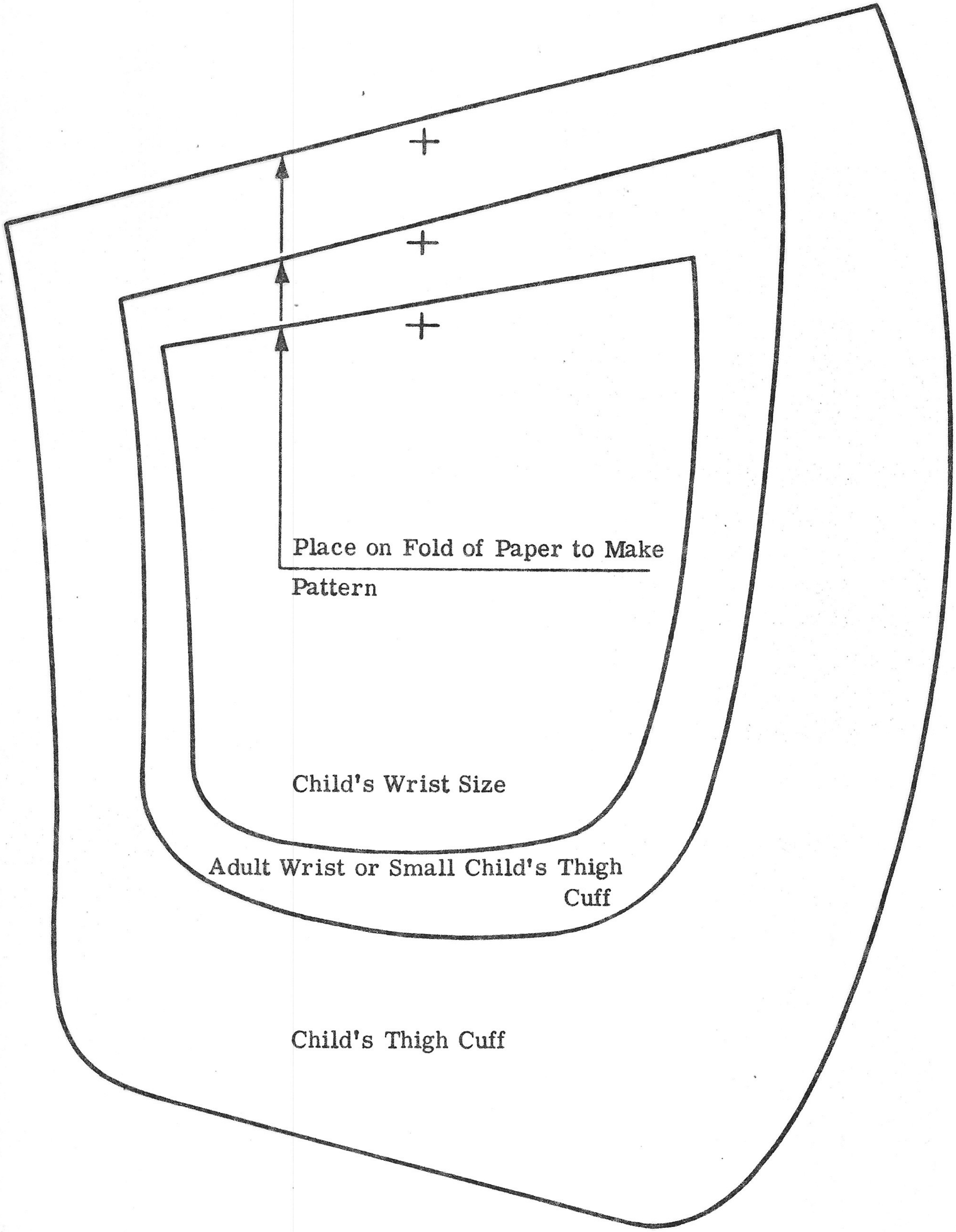


C. Plastic wrist cuff
attached to belt.



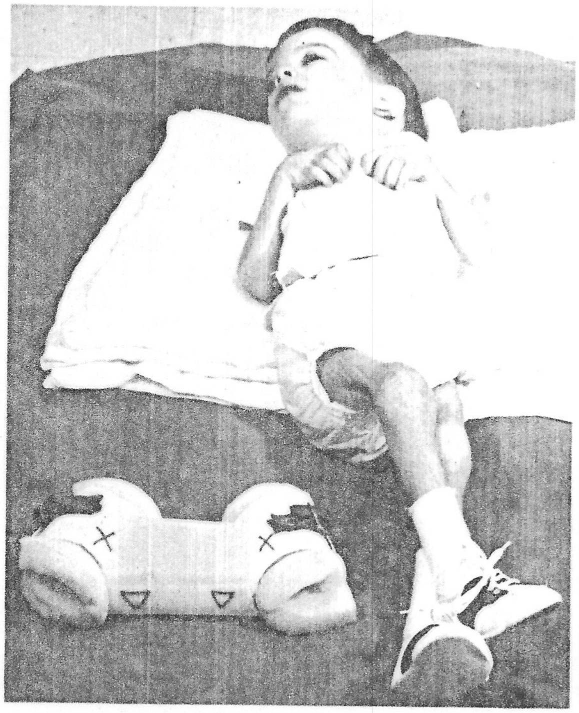
D. With out plastic cuff.

THIGH AND WRIST CUFF PATTERN

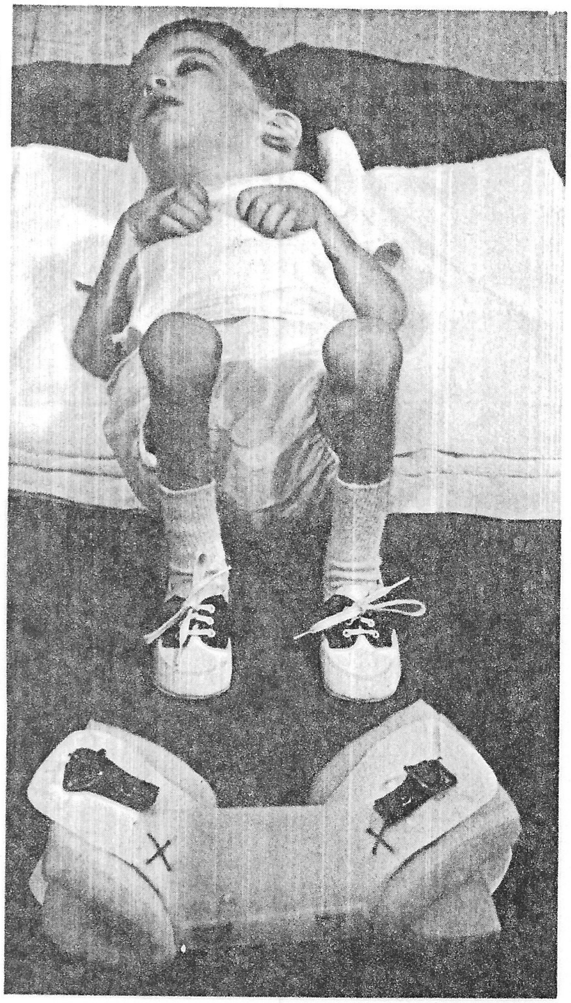

Place on Fold of Paper to Make Pattern
Child's Wrist Size
Adult Wrist or Small Child's Thigh Cuff
Child's Thigh Cuff

ACTUAL SIZE

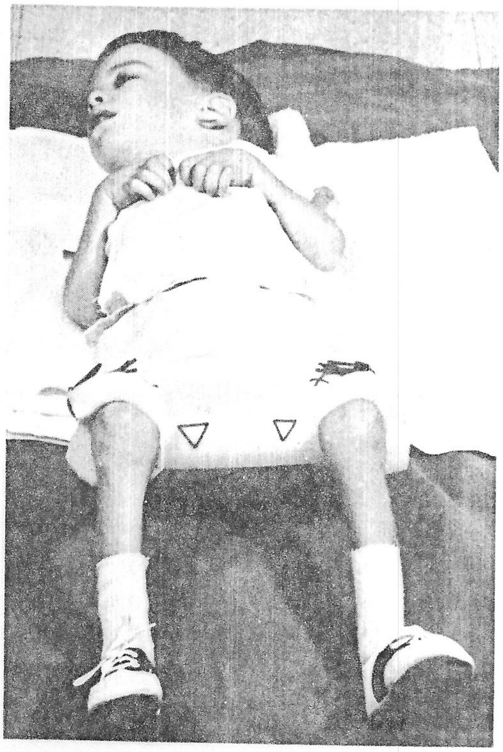
ABDUCTION SPREADER (Butterfly)



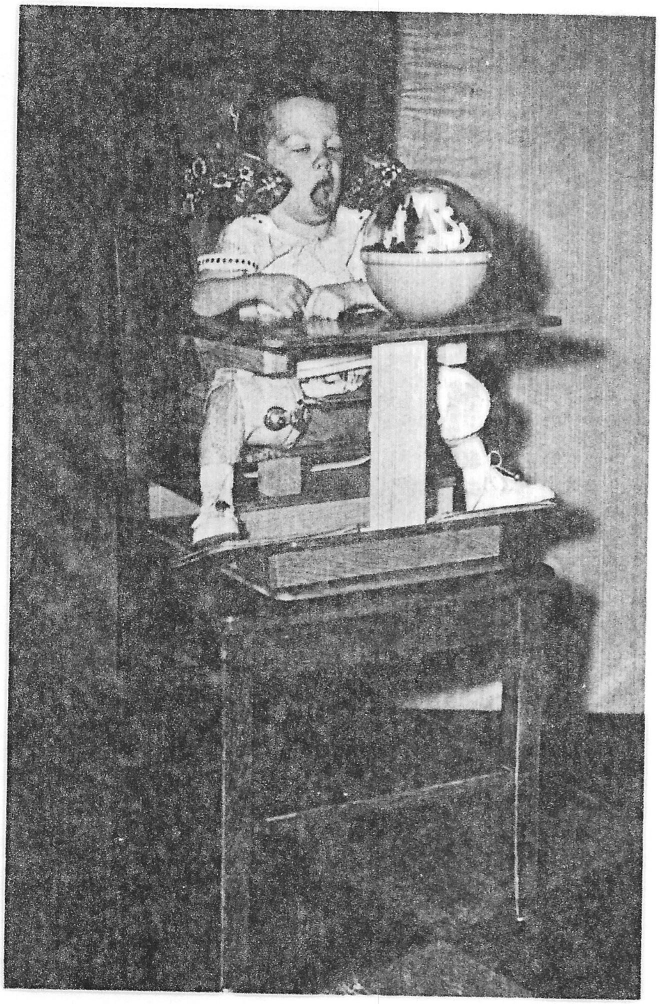
A. Spastic quad, age 5 yrs.
- (a) Lined with plastic surgical non-allergic sponge.
- (b) Less expensive and more easily available lambs wool (sold in stores for buffing machines).



B. Possible abduction.



C. Inches of abduction between knees prescribed by the doctor for day or sleep wearing.



MANUFACTURED BRACE

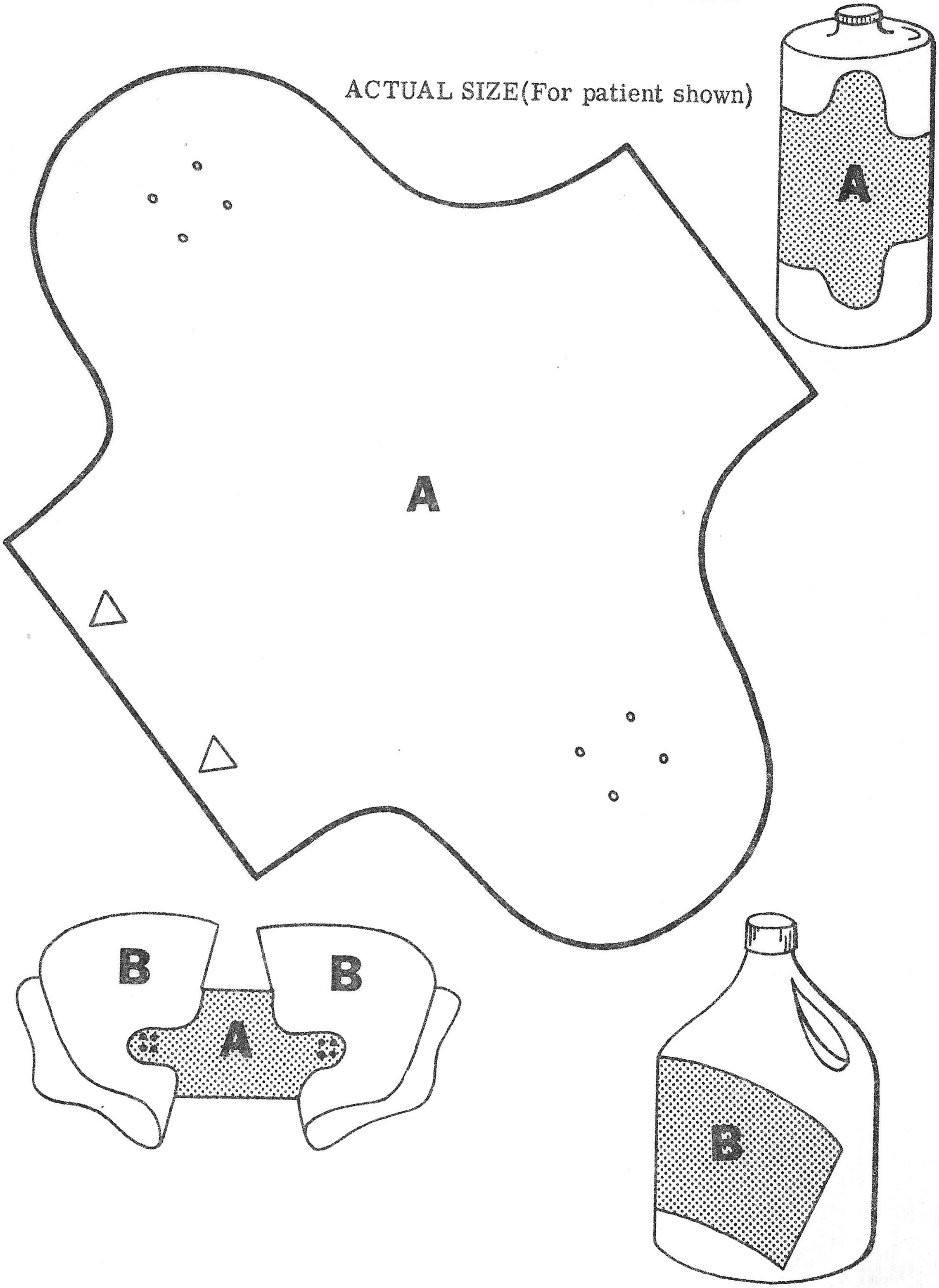
This type of abduction splint can be made from the plastic bottle pattern.

Abduction Butterfly

A. Use tall cylinder shaped bottle to cut (butterfly) for spreading thigh cuffs.

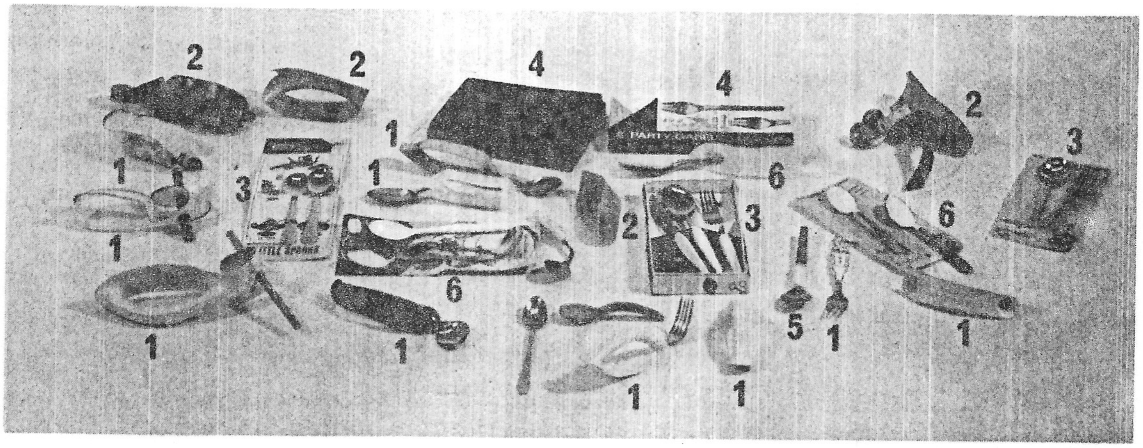
1. The doctor determines the number of inches spread between the knees.
2. Place pattern on bottle (see illustration).
3. Place narrow side towards body; wide span will then be towards knees (see illustration).
4. The wings overlay thigh cuffs.
5. Pierce dots with hot icepick through both wings and spreader plastic.
6. Use flat shoe lace through holes (cross stitch fashion) to hold cuff and spreader together. Each cuff will be laced at the top and bottom to the two wings.

ABDUCTION BUTTERFLY PATTERN

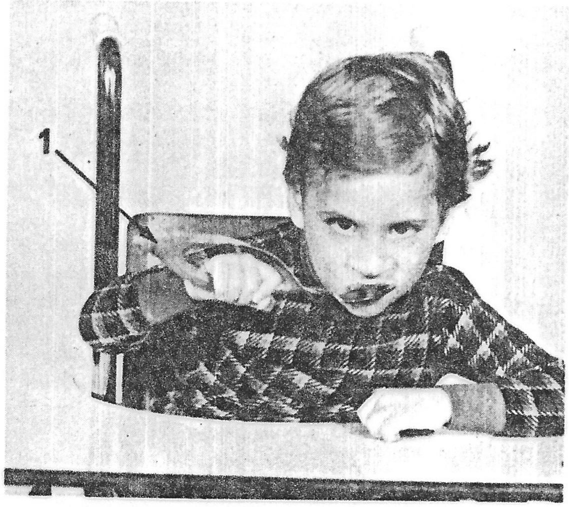


ACTUAL SIZE(For patient shown)

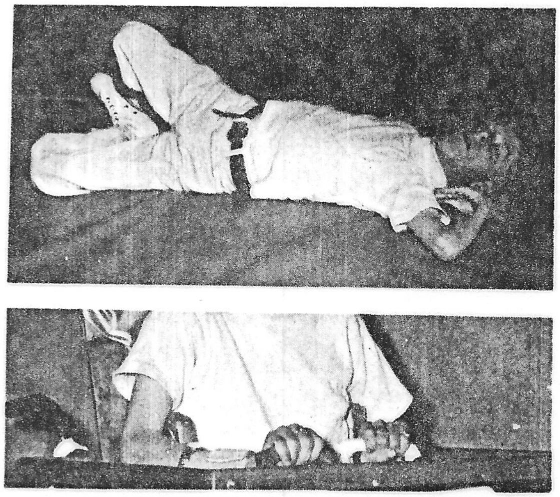
HANDLES FOR UTENSILS

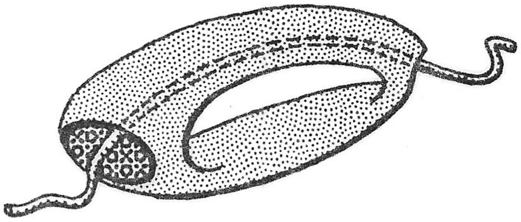


1. Assorted bottle handles to hold spoons, forks, typing stick, crayons.
2. Wide (circumference) handles to open fist, relax fingers, or aerate the palms.
3. Children's table silver available at discount stores, etc.
4. Party fork (knife, fork and spoon), fruit forks (replaces the hospital fork and costs only a fraction).
5. Replace broken spoon handle with old tooth brush handle, gimp and nail polish.
6. Coated spoons for children who clamp teeth on bowl (sold in baby departments and drug stores).



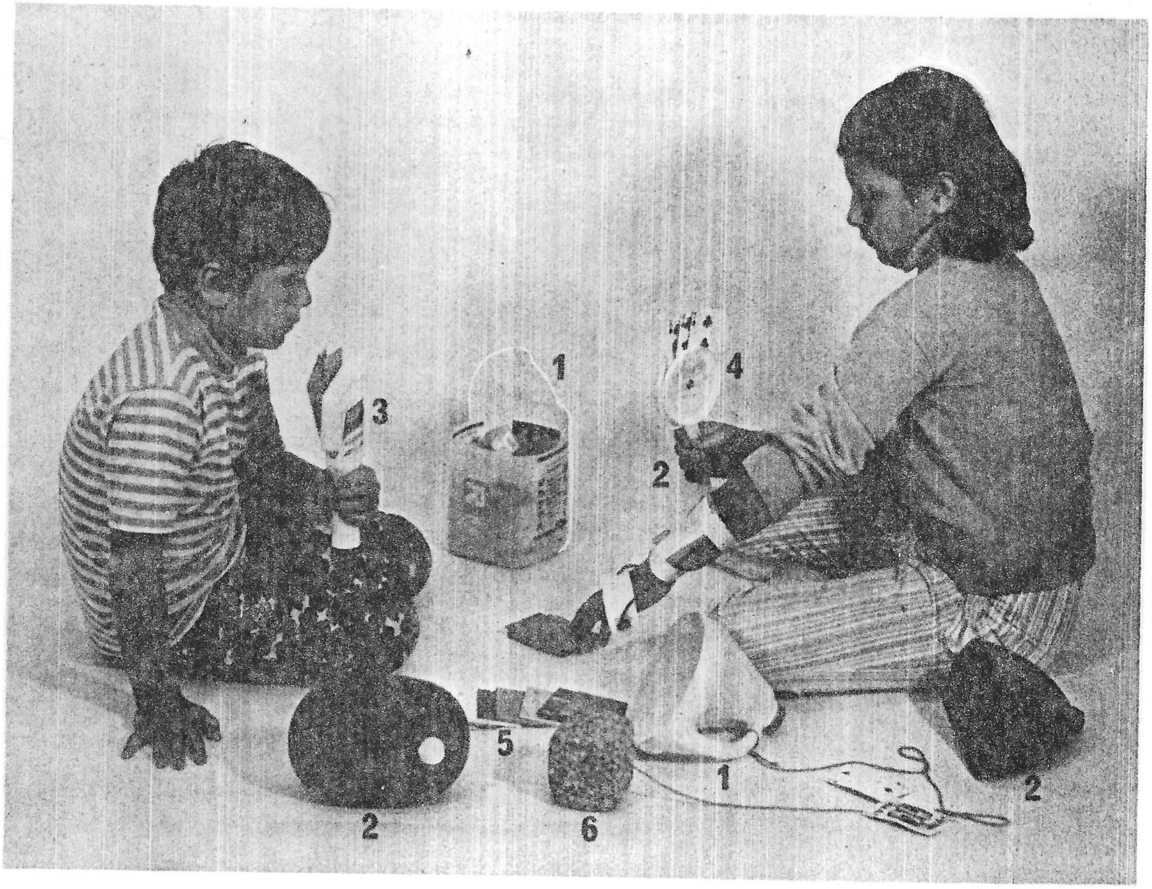
Plastic handle spoon grip (prevents turning spoon over).





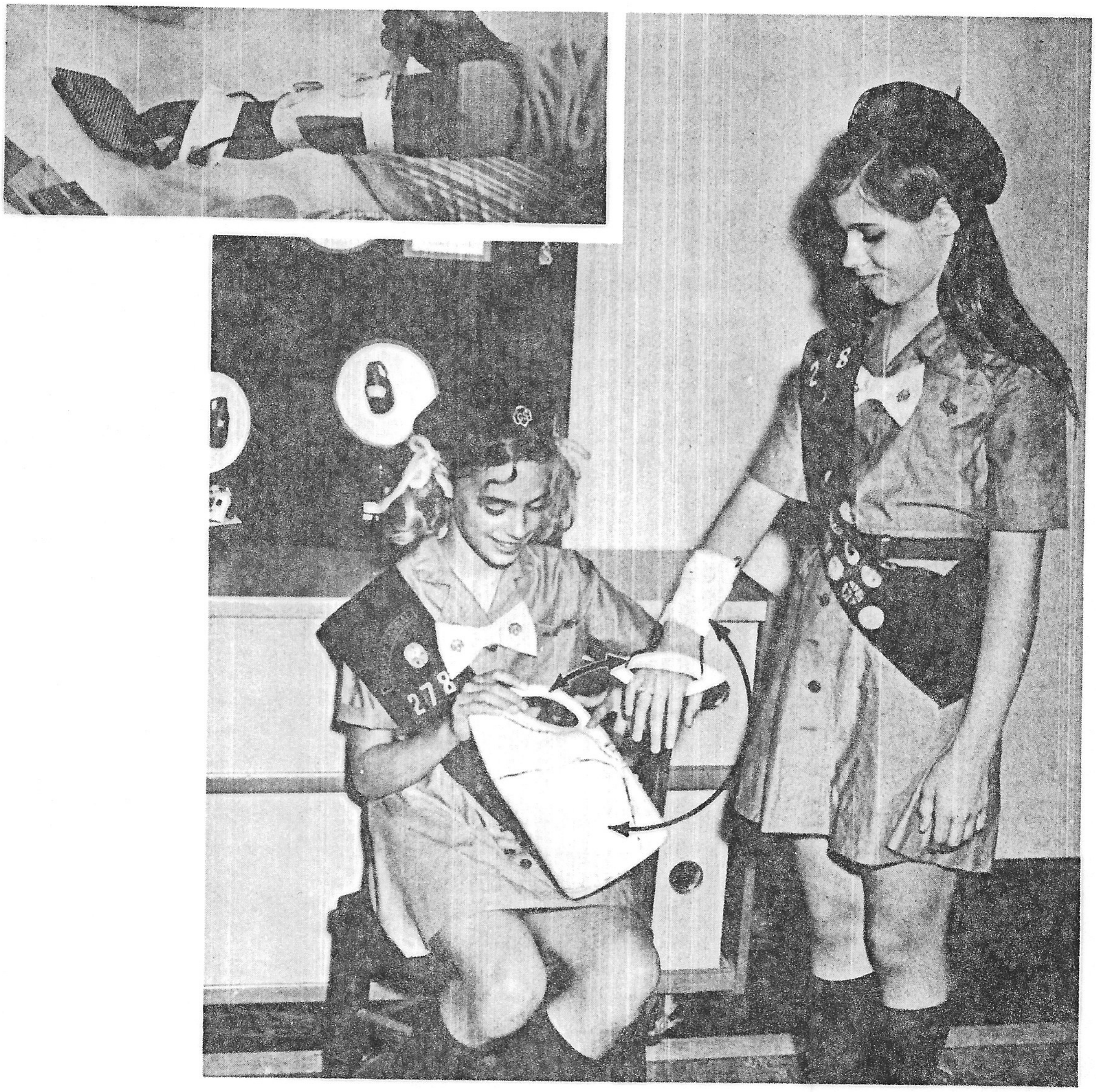
Handles to aerate palms(large size).

HANDLES

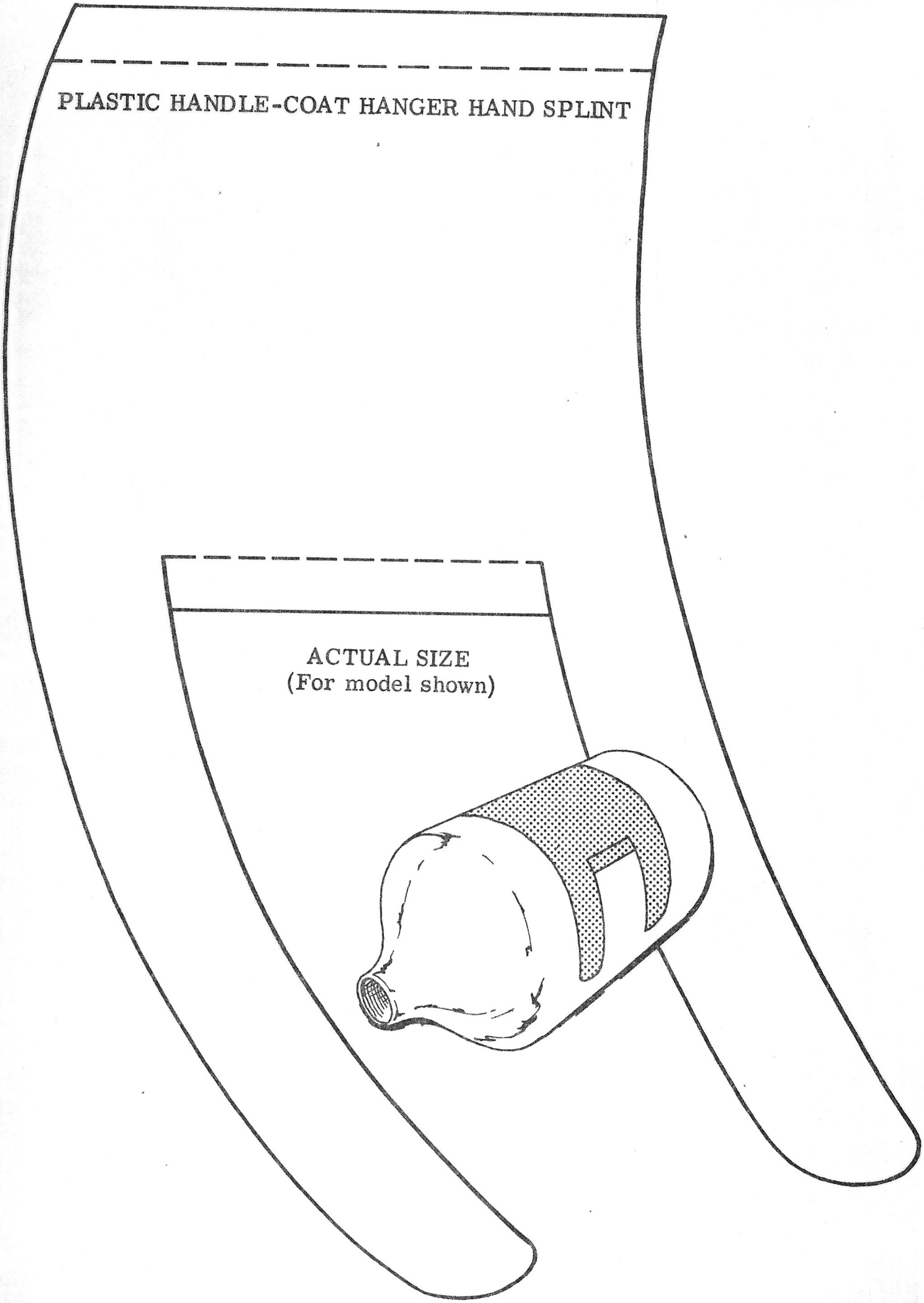


1. & 2. Different types of bottle handles for varied grasp.
   - a. Bottles are cut to make toss game with scrap plastic square (#6).
3. Head & Shoulders bottle used upside down for dowel-type grip-card holder or sandwich. (Note inserted plastic square - could be toasted sandwich or hamburger bun.)
4. Model uses 2 gallon square bottle handle with tongue centered and fixed between 2 round plastic covers with brass brad. This can also be made into a sandwich holder.
5. Scattered sample linoleum tiles for games like checkers or tic tac toe.

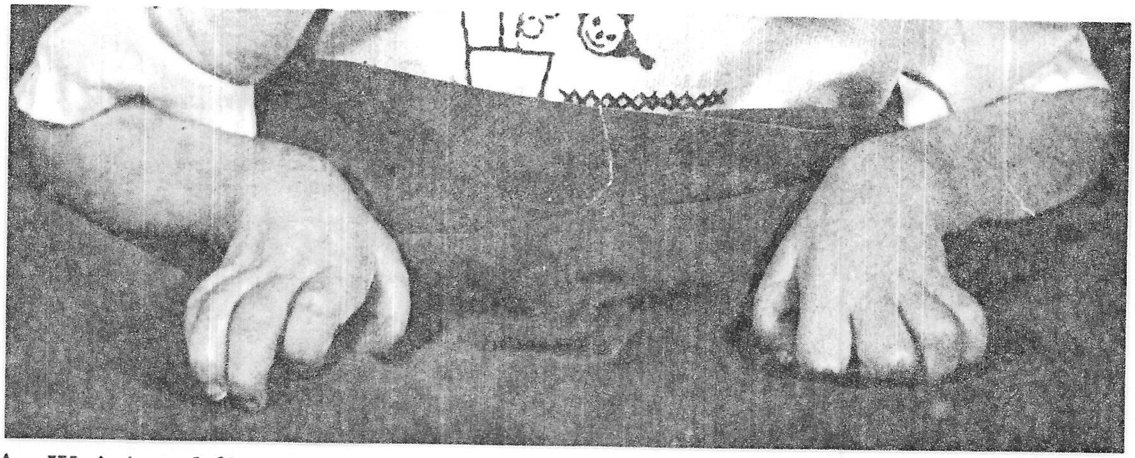
PLASTIC HANDLE - COAT HANGER HAND SPLINT



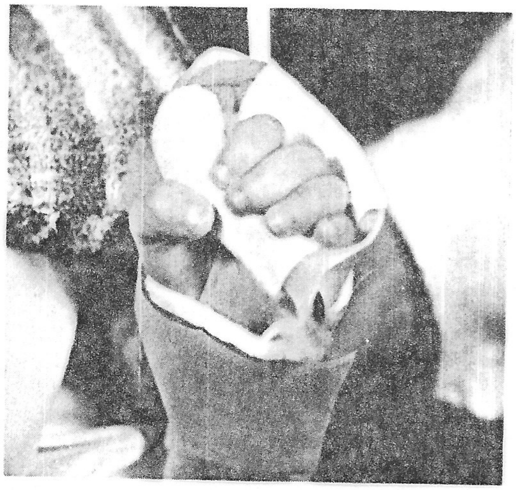
1. Select correct size bottle handle to fit natural resting position of hand and wrist.
2. Insert coat hanger wire through plastic bottle handle (20" of wire). Bend and shape wire with pliers leaving 8" showing on both sides. (Shown on 14 year old Scout and model.)
3. Cut pattern to fold over ends of coat hanger wire as well as cover the forearm.
4. Loop wire ends 1/2" back.
5. Cover wire with 1/2" fold over plastic material.
6. Use Scholl's adhesive-backed 1/8" sponge-covered felt to face forearm and hold plastic material over wire.
7. Fasten straps with velcro, snaps or ties around wrist and forearm.


PLASTIC HANDLE-COAT HANGER HAND SPLINT
ACTUAL SIZE
(For model shown)

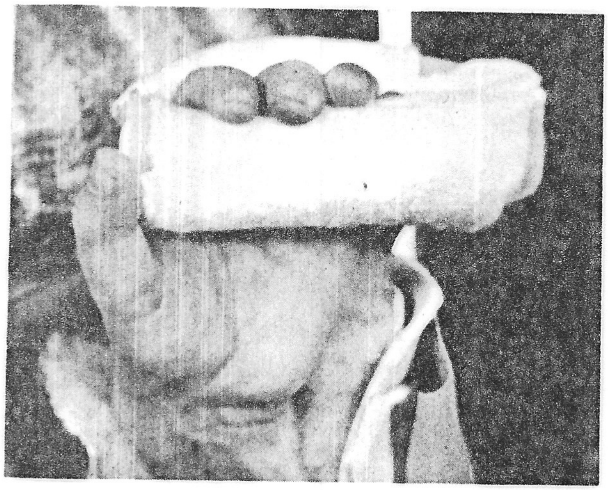
PLASTIC HANDLE - COAT HANGER HAND SPLINT



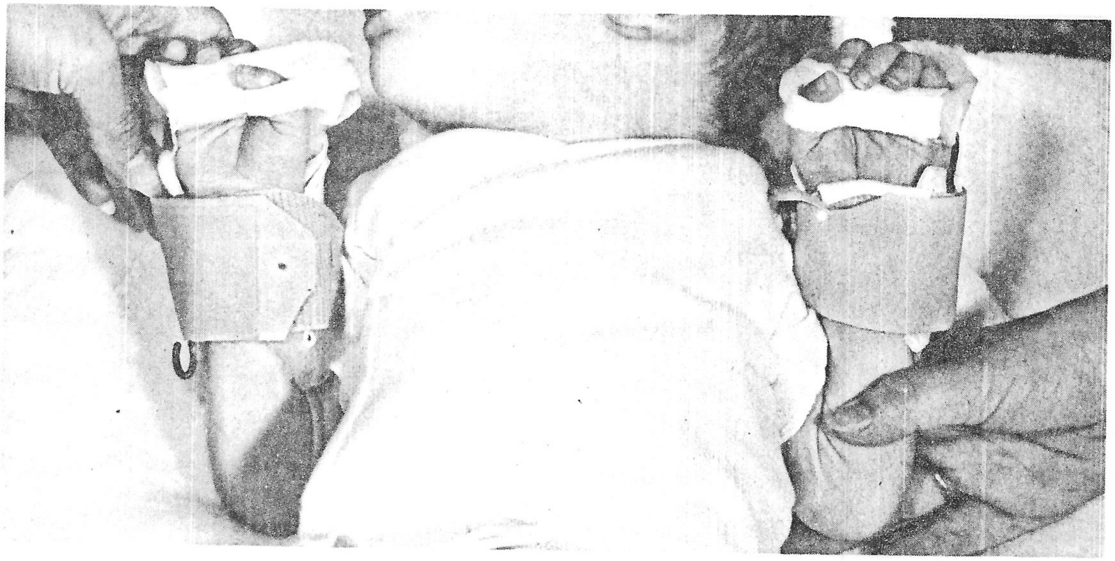
A. Wrist and finger contracture of spastic quad.



B. Velcro closure.

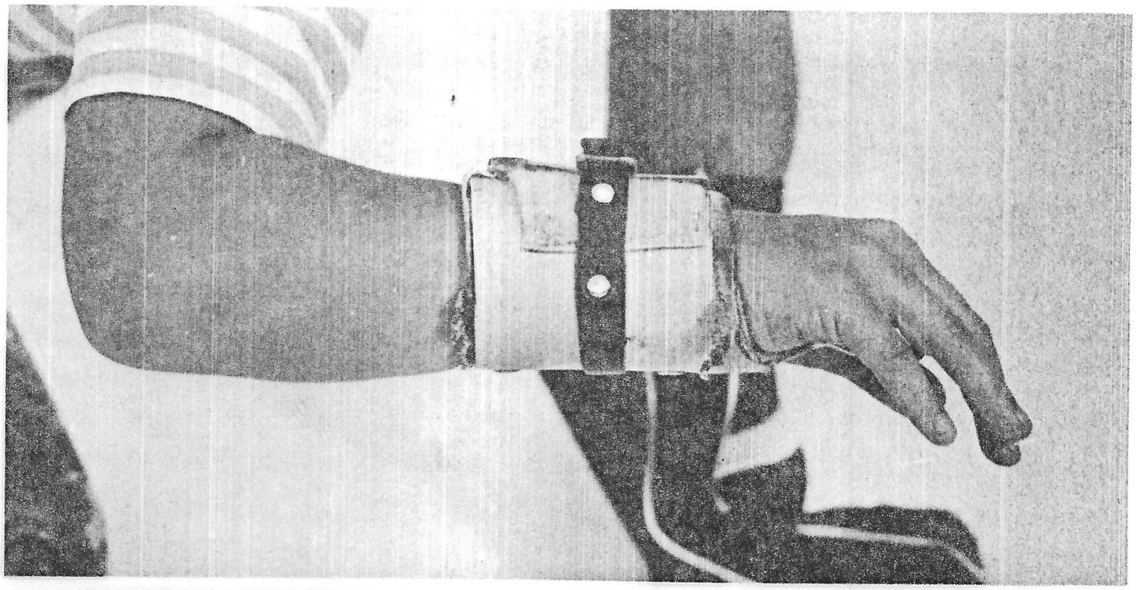


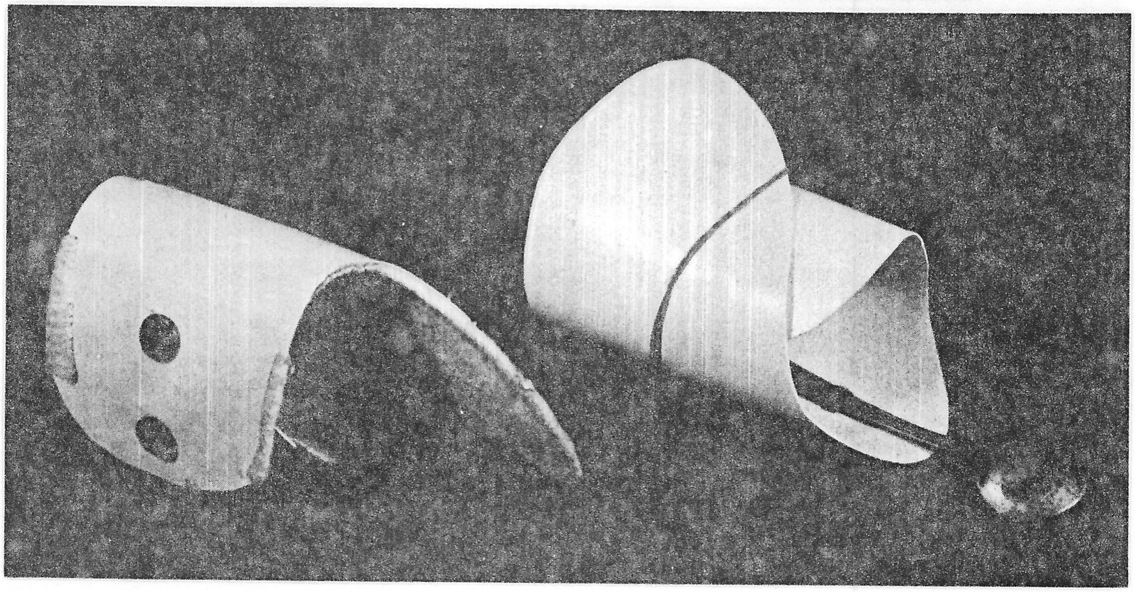
C. Lined with lamb's wool



D. Thumb holder added.

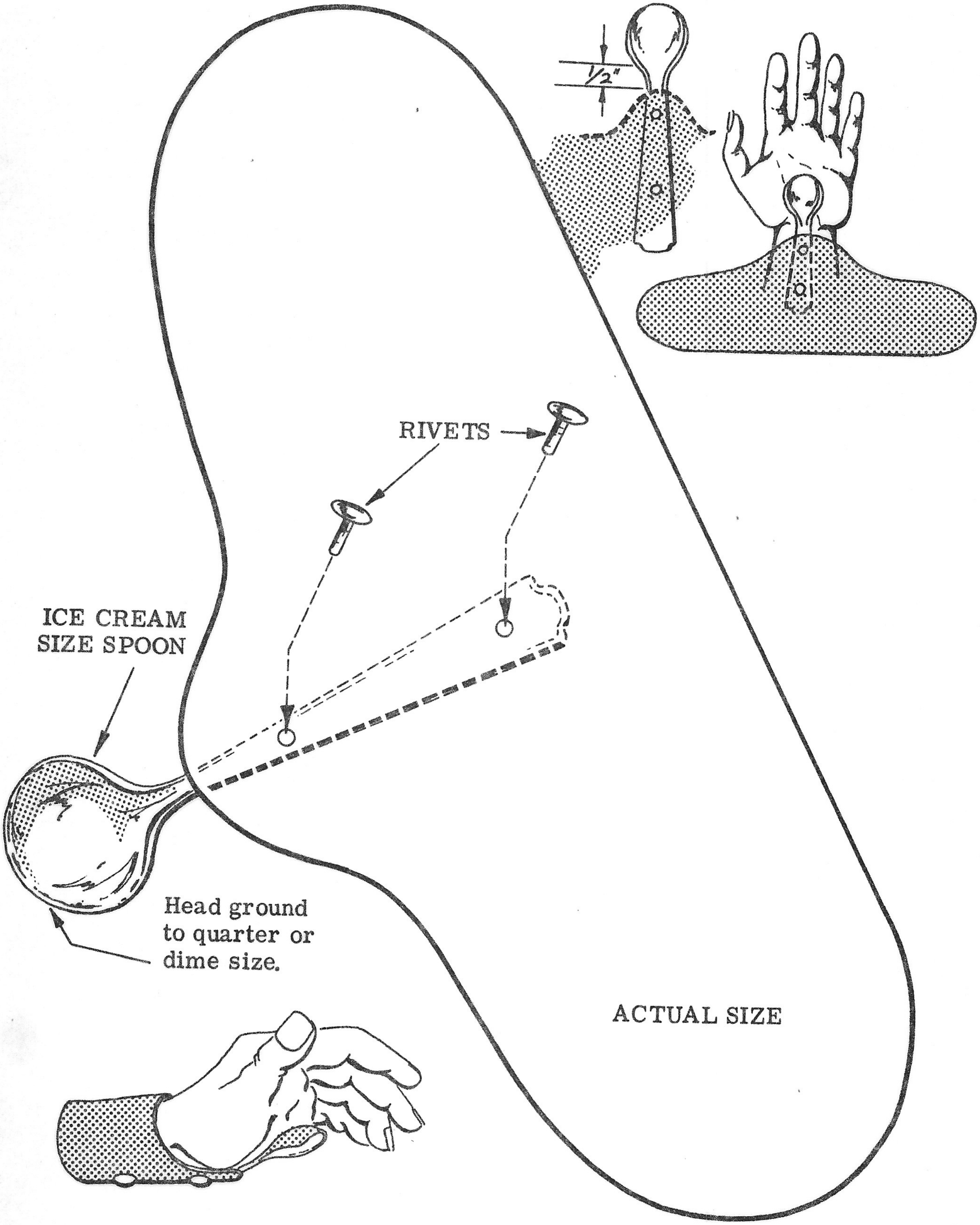
SPOON SPLINT TO HOLD WRIST NEUTRAL



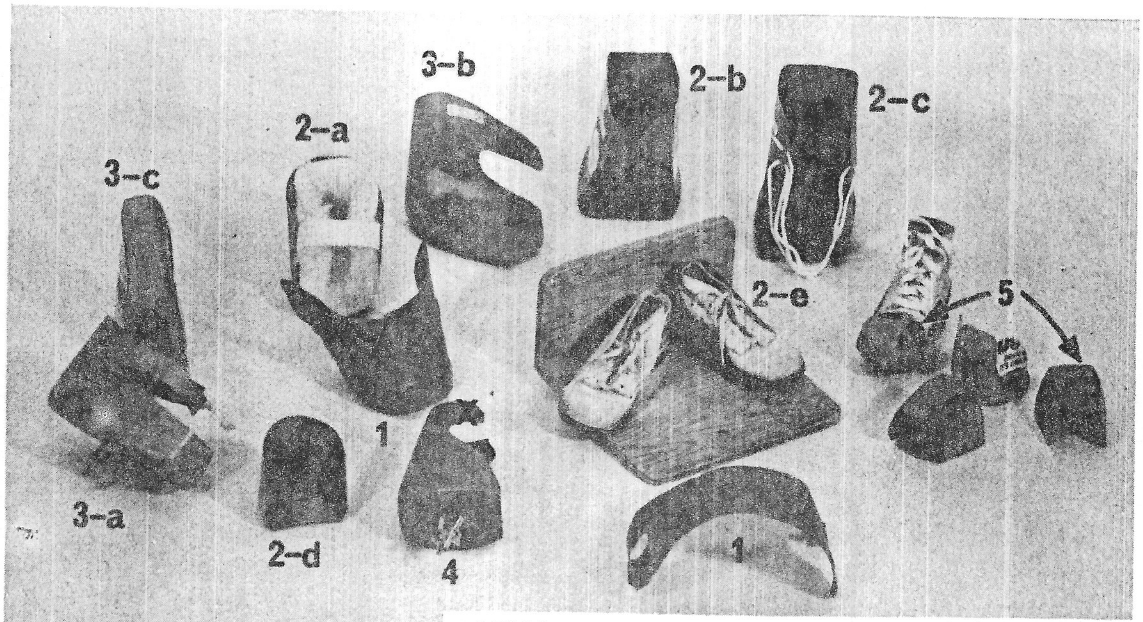


1. Draw pattern leaving 2" overlap of plastic for closure.
2. Use round-bowl spoon (ice cream or demitasse filed to quarter or dime size).
3. Drill with 1/8" bit 2 holes in spoon handle, one at neck, one in stem - see diagram.
4. Use heated ice pick for holes in plastic (lay drilled spoon on plastic, mark and punch).
5. Use 1/8" rapid rivets to attach spoon to plastic. (All shoe repair stores carry these.)
6. Pad only if necessary - use Scholl's 1/8" moleskin-covered sponge with adhesive backing.
7. Bend spoon to raise wrist to neutral position.
8. Overlap plastic for wrist closure - velcro, snaps or ties.

SPOON SPLINT TO HOLD WRIST NEUTRAL


½"
RIVETS
ICE CREAM SIZE SPOON
Head ground to quarter or dime size.
ACTUAL SIZE

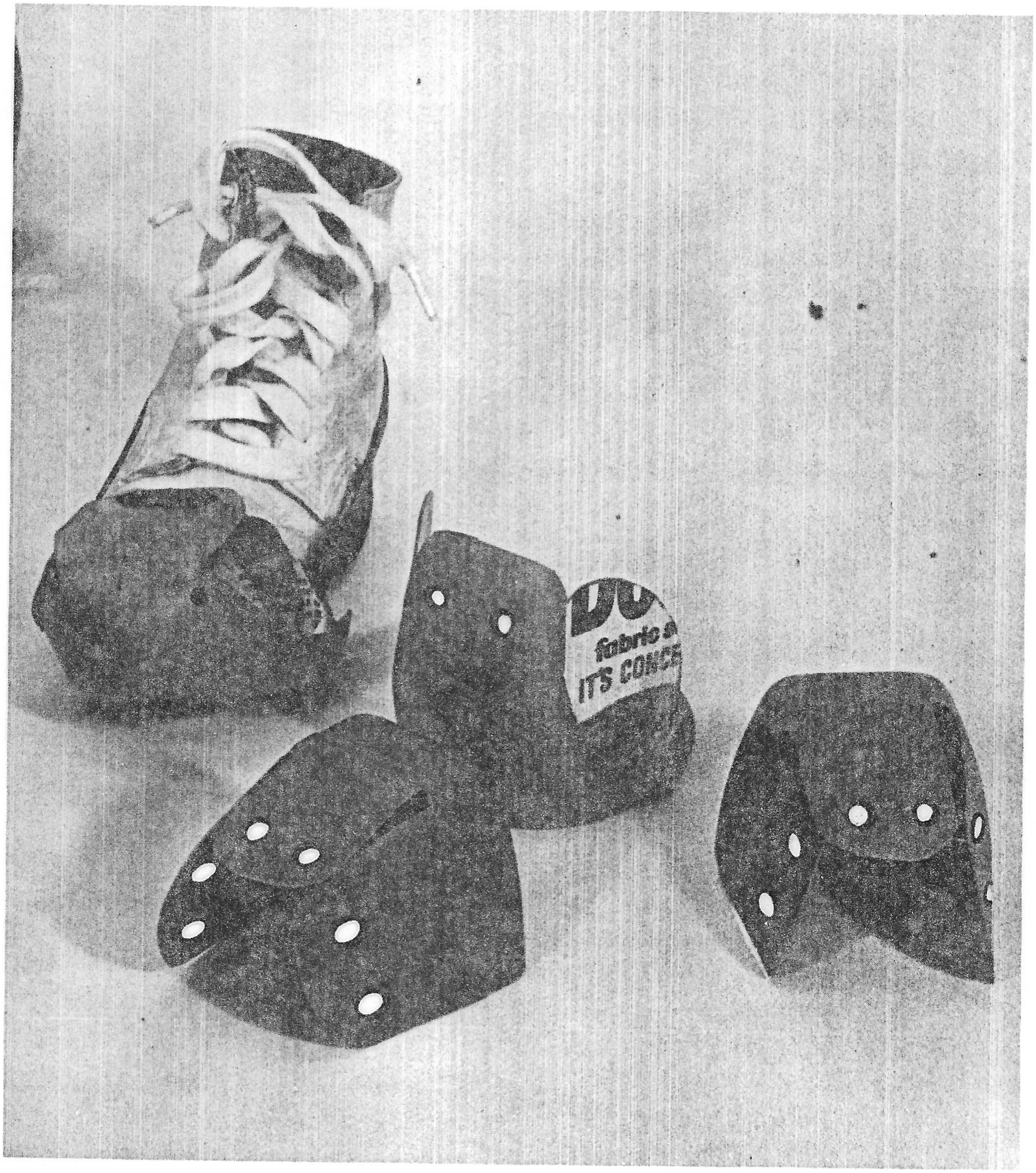
NOTE; Use rubber band or tape to attach cuff to wrist.



RECTANGULAR OR OVAL BASE BOTTLES

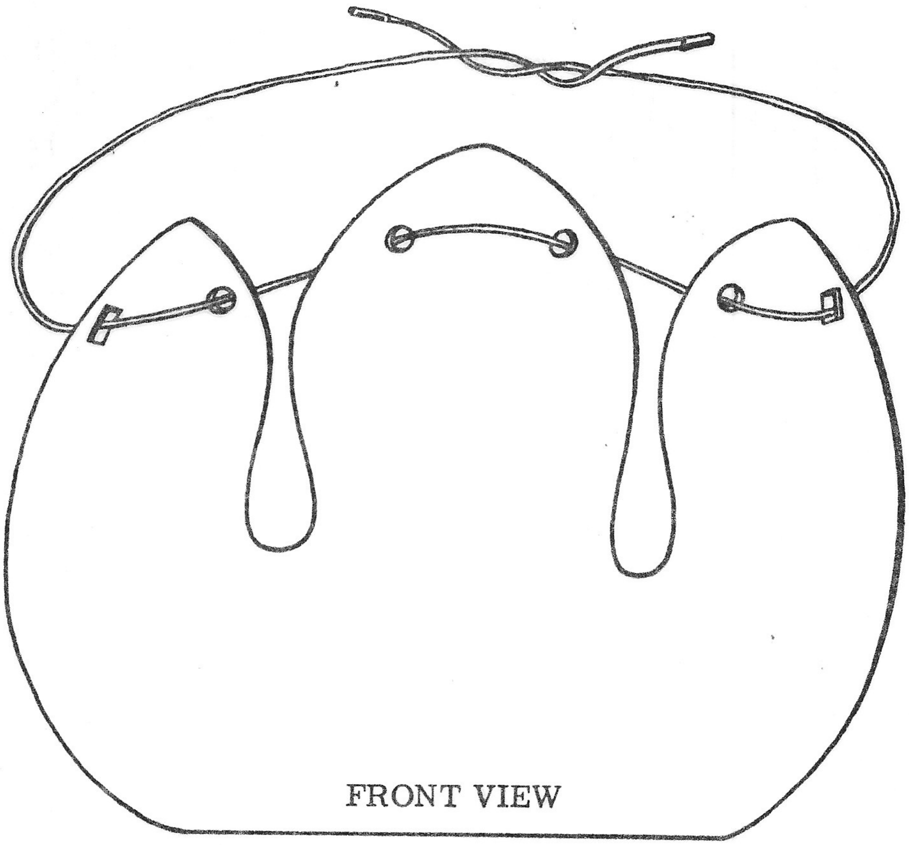
1. Toe stirrup loops for bicycle pedal.
2. Heel cups: a. Protect heels in bed with lamb's wool liner.
    b. Attach to wheelchair footrest.
    c. Sole cover for walking flat-bottom cast (add inner tube rubber sole).
    d. Attach to bicycle.
    e. Prevent drop foot - day or night.
3. a. Tricycle boot (can use without child's shoes - sponge insert).
    b. Plastic shoe with sponge insole (for chair-fast child without shoes).
    c. Tricycle boot with plywood sole (for heavy wear).
4. Tall bottle with rectangular base - "short leg brace" to prevent drop foot in tricycle riding - lace shoe to sides and overlap calf band (X) below knee.
5. Crawling toe protectors.

CRAWLING SHOE-TOE PROTECTOR



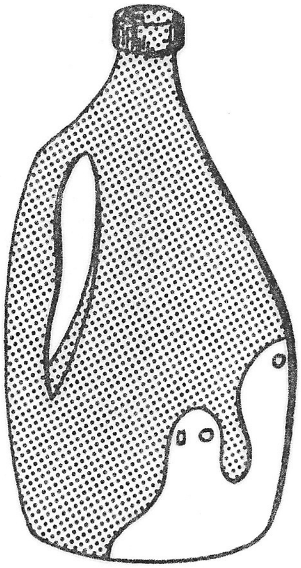
1. Select bottle with oval or rectangular shaped base.
2. Pattern is actual size of child's shoe.
3. Pierce holes as diagrammed.
4. Fold center over sides, matching holes.
5. Thread rubber (inner tube strip) as diagrammed, and knot around heel of shoe.

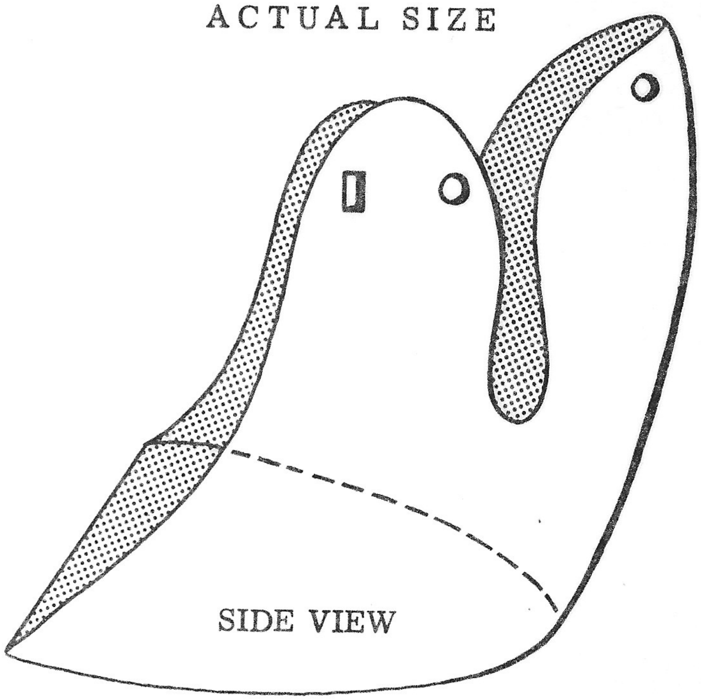
CRAWLING SHOE-TOE PROTECTOR



FRONT VIEW

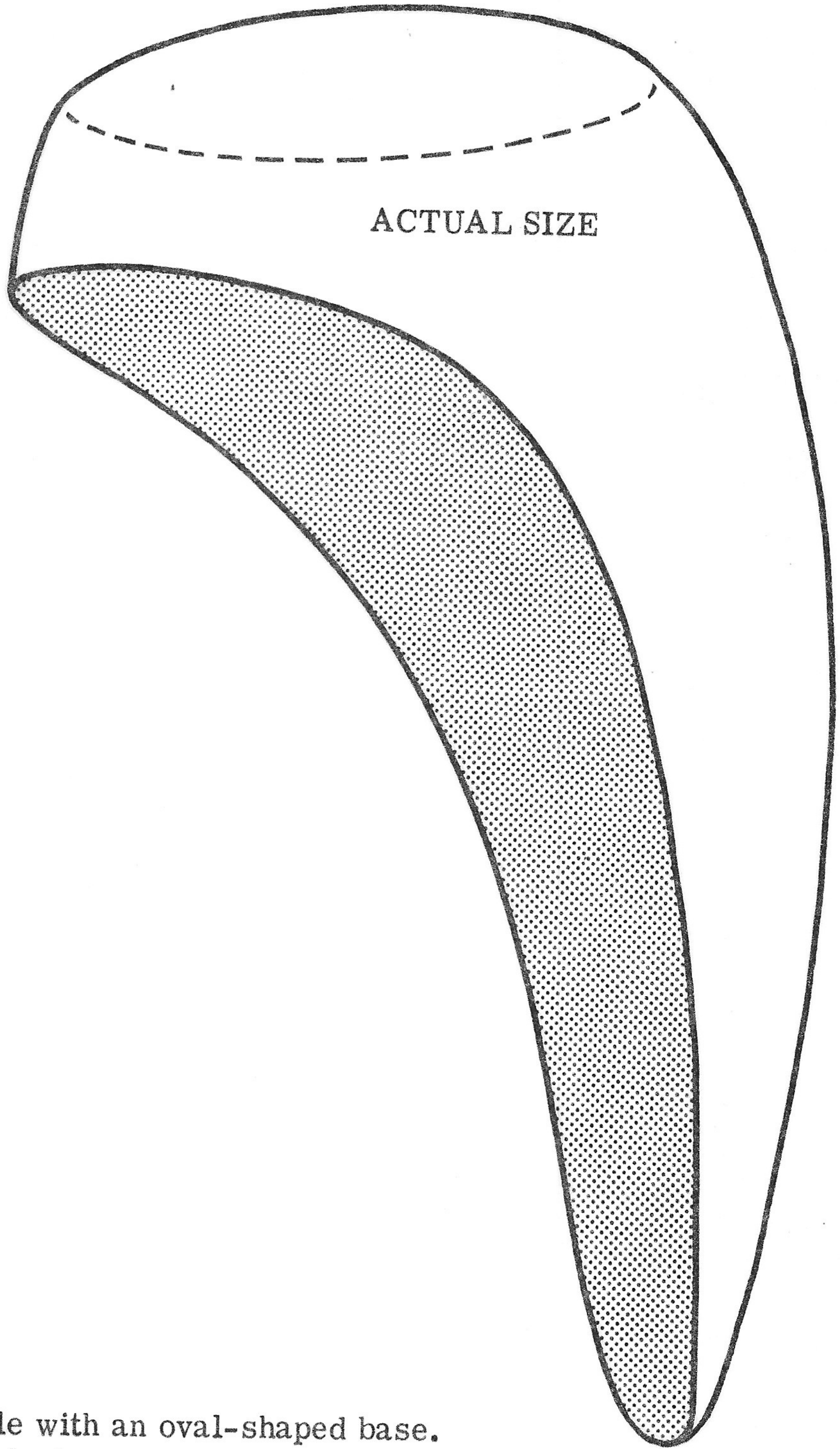
ACTUAL SIZE

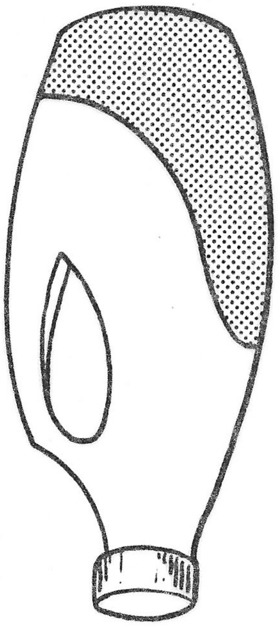




SIDE VIEW

BOY'S DEFLECTOR

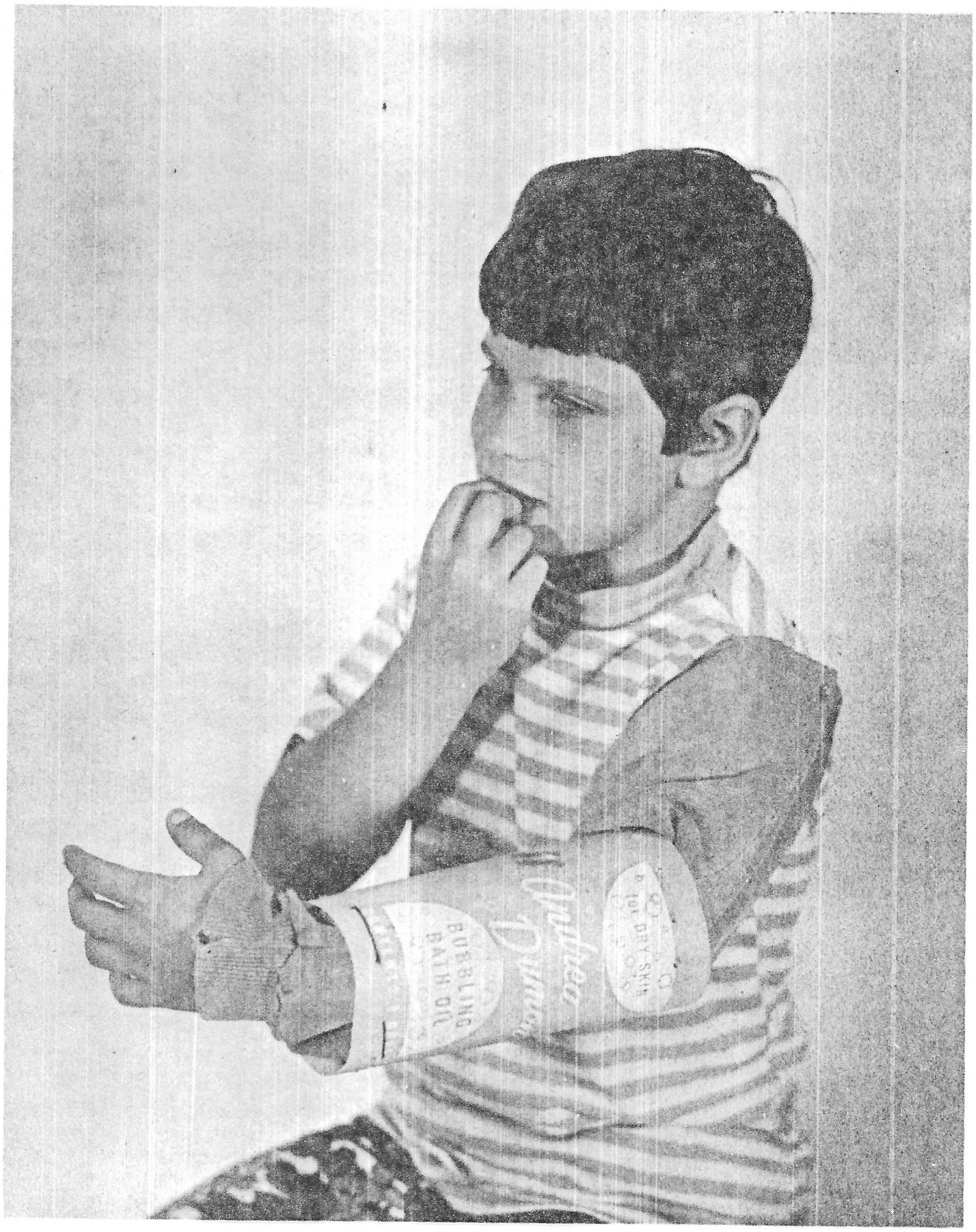




1. Use plastic bottle with an oval-shaped base.
2. Turn bottle upside down.
3. Draw on pattern leaving bottle bottom whole.
4. Place between thighs, do not fasten to potty chair.

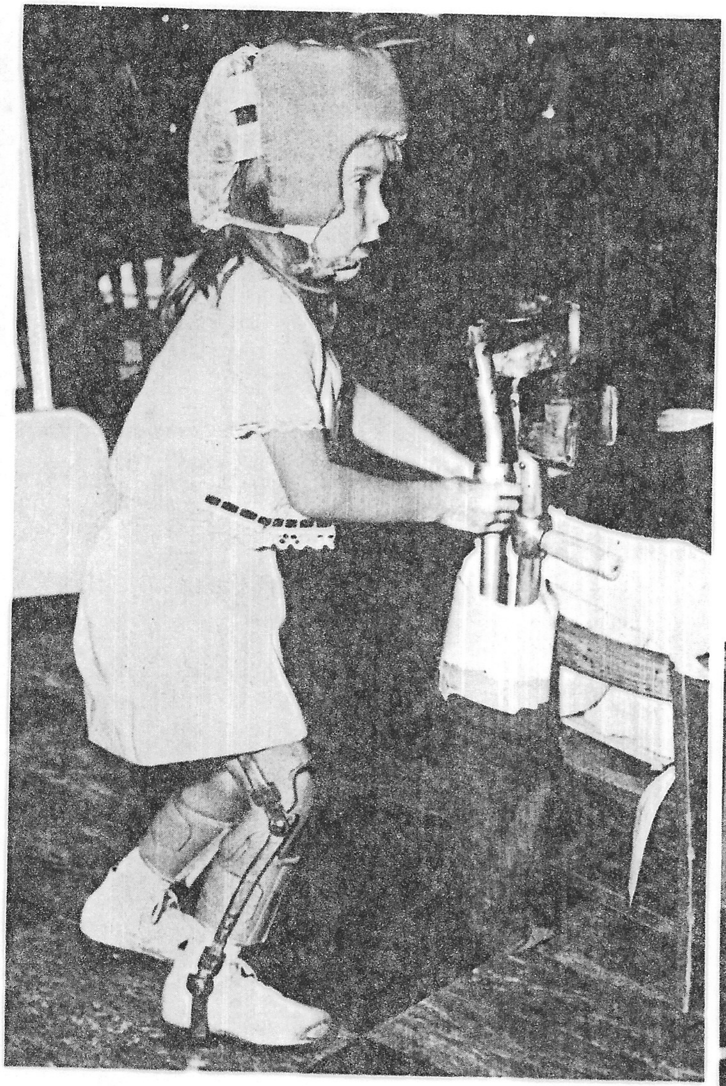
NOTE: This can be sterilized.

PLASTIC BOTTLE ELBOW RESTRAINT

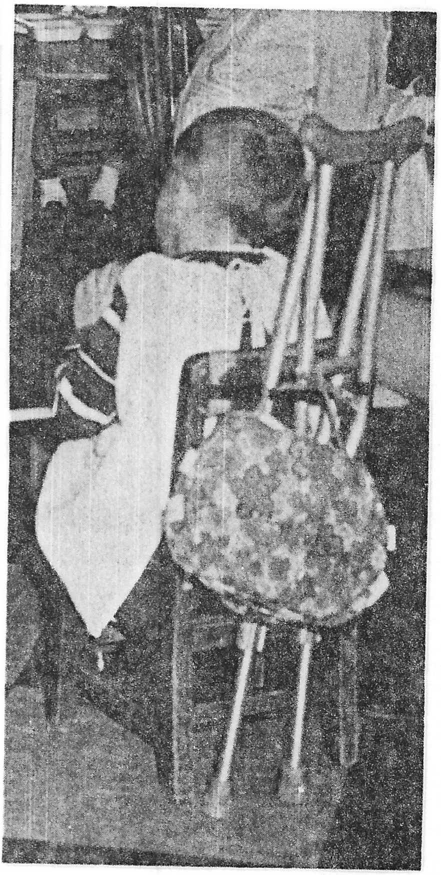


1. Select cylinder plastic bottle to fit circumference of child's arm (long enough to prevent elbow flexion - 8" over-all length is sufficient for adult).
2. Pierce holes around top and bottom, sew to sweatshirt sleeve (see photo).
3. Sweatshirt sleeve may be stitched daily at neck, pinned or snapped in place depending on individual's need or destruction ability of child.
4. Plastic sleeve may be split and laced together, if necessary.

CRUTCH HOLDER - GALLON-SIZED BOTTLE

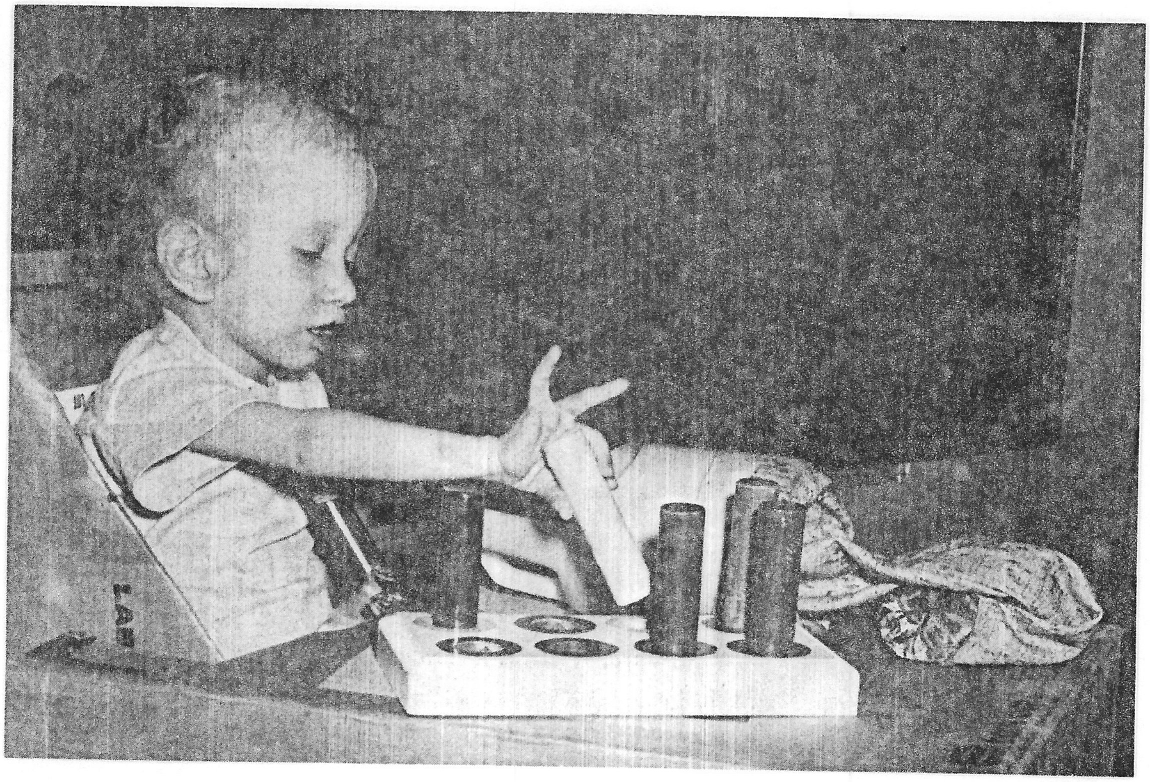


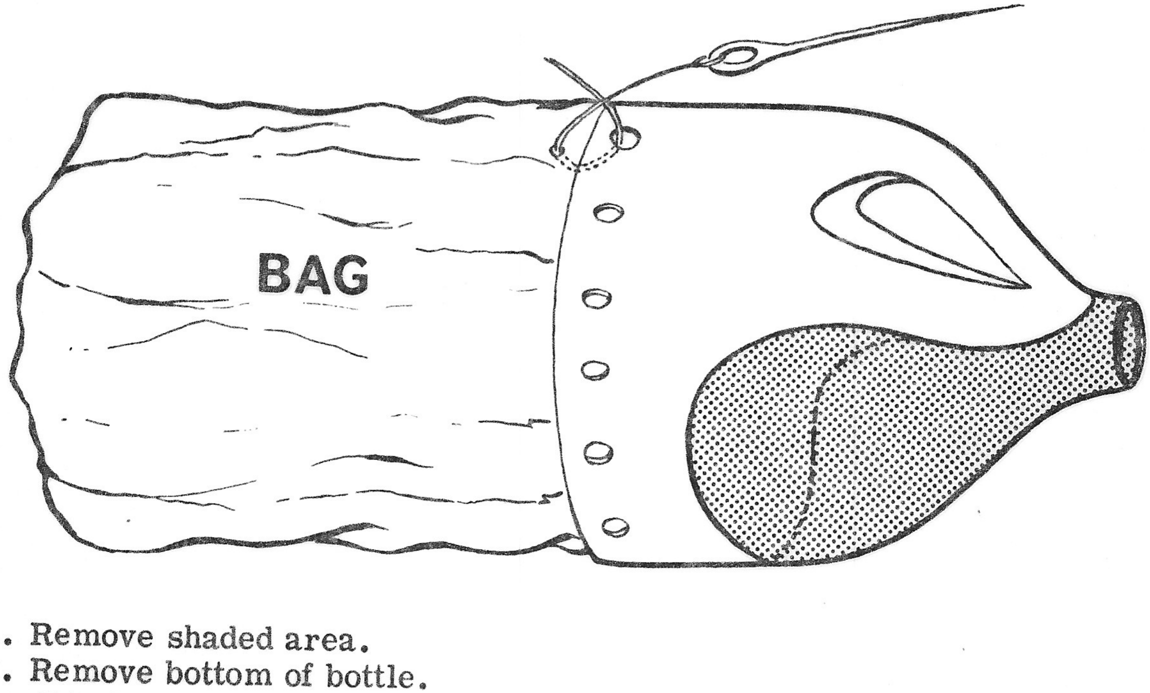
Bottle bag to hold length of crutches. Bottle handle looped to chair with black elastic.



Black elastic band made from inner tube

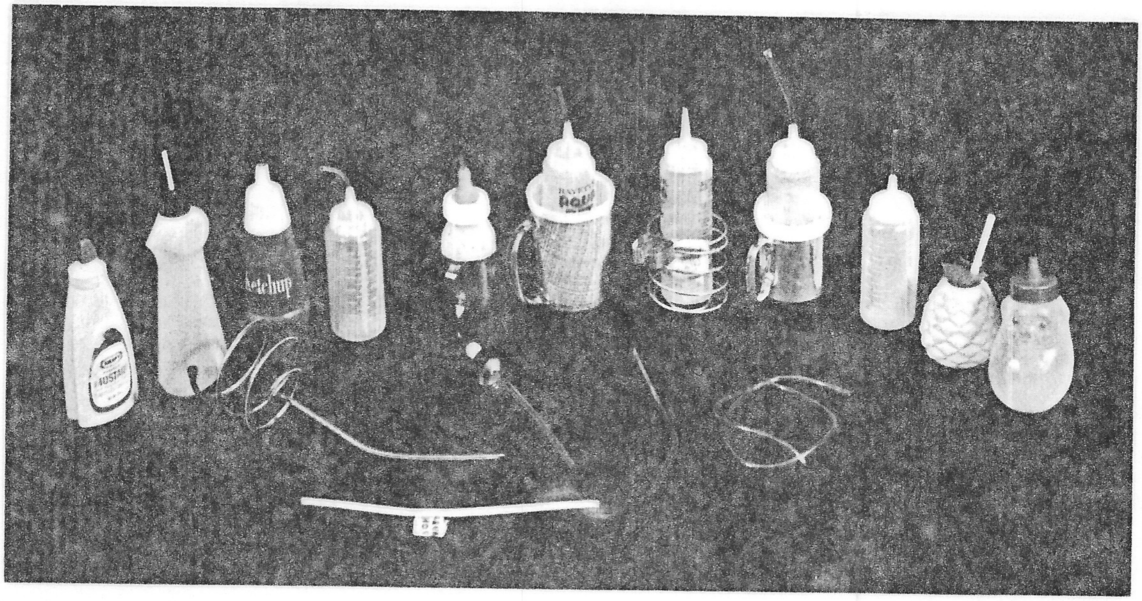
CRUTCH HOLDER USED AS TOY CARRIER





1. Remove shaded area.
2. Remove bottom of bottle.
3. Attach cloth bag with masking tape or lace to bottle.

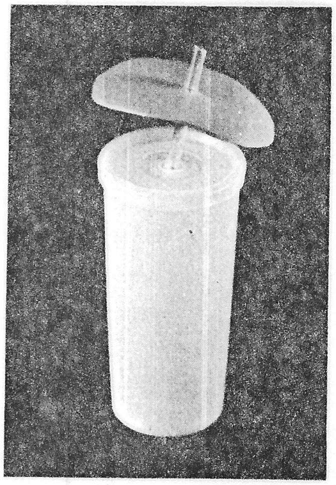
BOTTLES



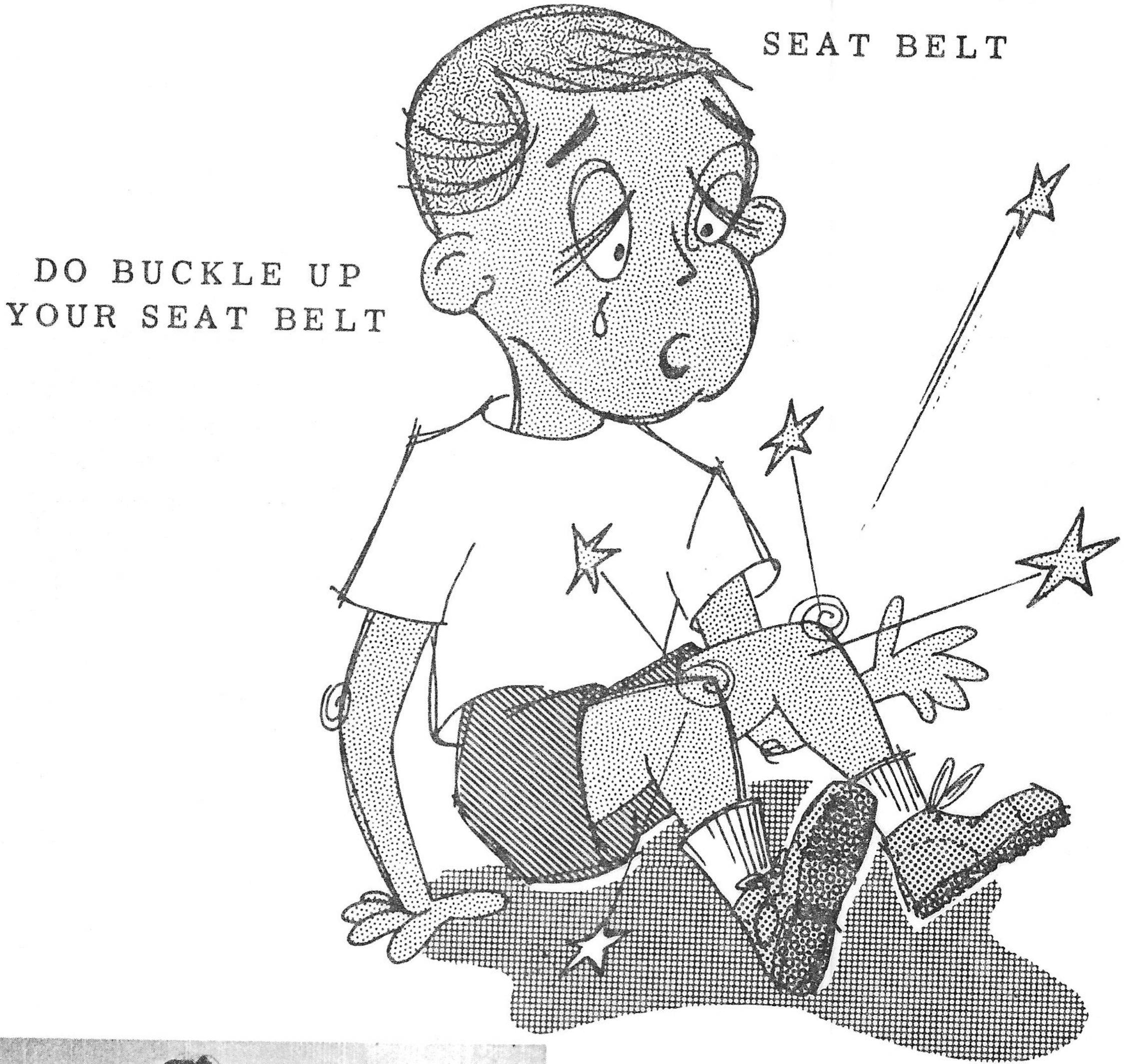
All have screw on caps to prevent popping off with pressure when squeezed.
Aquarium tubing, soft and firm.
Spirals are glass holders for back yard or parties.
Nipple straw insert (sold in baby department).

Soap squeeze bottle with screw top.

Lady Clairol bottle with screw on spout. Aquarium tubing straw.

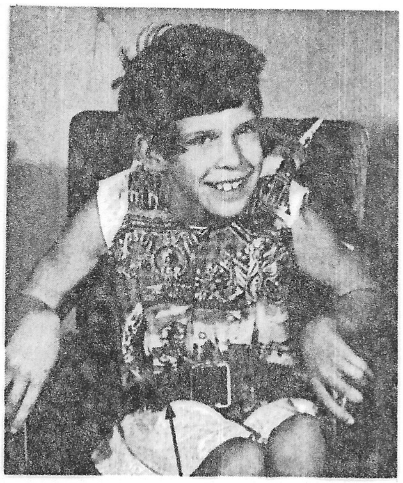


Plastic circle to remind lip closure.


SEAT BELT
DO BUCKLE UP
YOUR SEAT BELT

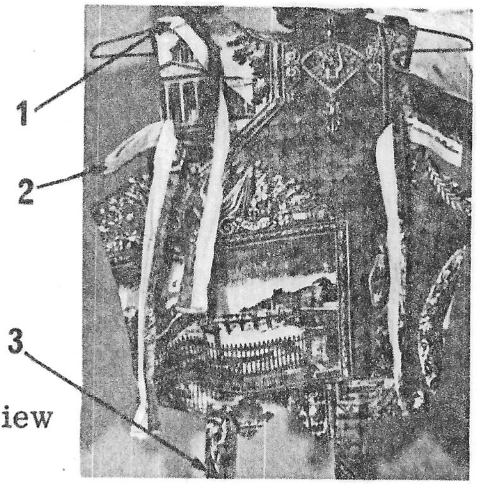
Army type buckles and webb belts used as wheel chair seat belts.

VEST - TO ASSIST UPRIGHT TRUNK POSITIONING



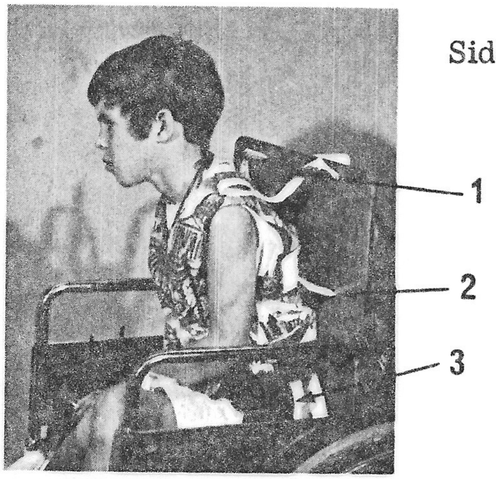
Front View

Showing:
Seat belt threaded through vest loops.



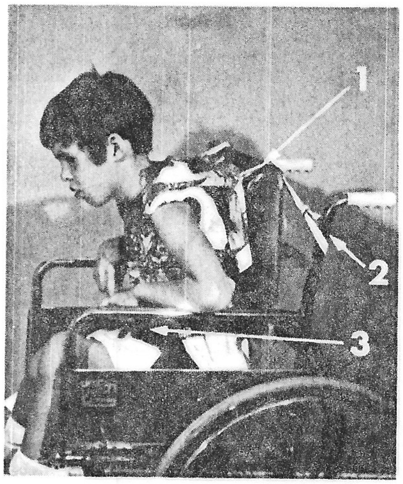
Rear View

Showing:
1. Shoulder seam loop.
2. Mid armhole loop (on rear side).
3. Seat belt loop hanging down from front vest parts.



Side View

Vest shoulder strap loose
1. Shoulder seam strap loose but threaded through chair back.
2. Armhole strap loose but threaded through chair back.
3. Seat belt fastened.

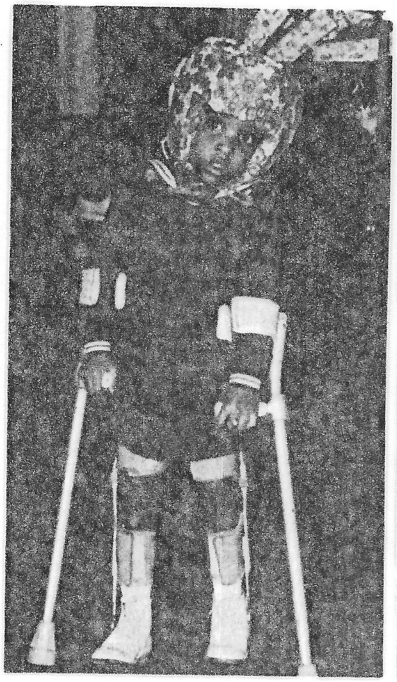


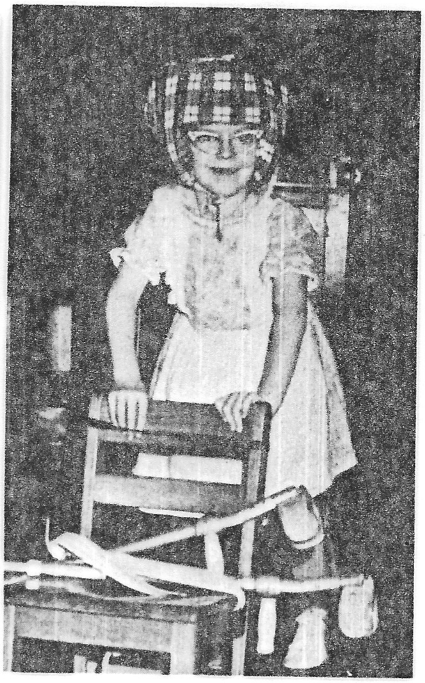
Vest

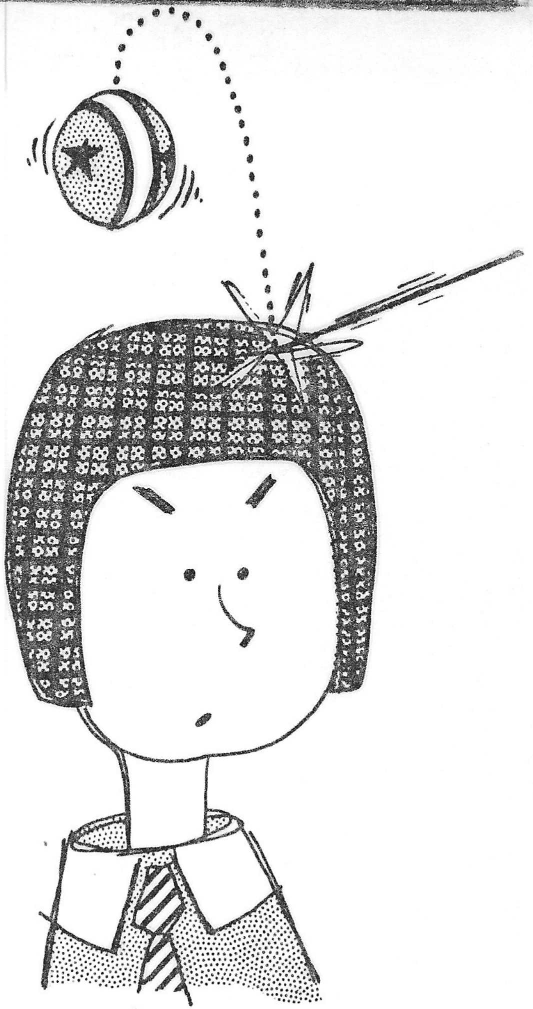
1. Shoulder seam threaded through seat back and looped around chair from #2 is tied to 1 and cannot be seen.

Note: Lap tray is missing and child leans heavily on elbows. When elbows are close to body on lap tray (and not abducted to meet chair frame), sitting posture is good. Look back at picture #3 and see elbow next to body. Chair frame is too wide for child.

HELMET (Urethane Sponge)







Key: (L) loop of elastic (8 needed)
(S) side strip (4 needed)

SUPPLIES: Material - cotton, gingham, calicos; 1 yd. of 1 1/4" webbed elastic, 1" thick plastic sponge to be cut for front and back, cut sponge to fit inside dotted seam allowance.

DIRECTIONS:

Front (inside):

1. Place right sides of two front pieces together, pin ends of 2" elastic strip to form loop between the two surfaces. Pin one end of 2" side elastic between 2 surfaces. Finished side elastic strips will be 1" visible.
2. Sew around front pieces leaving notched area open so that sponge can be added. Turn, press, turn in remaining seam allowance and top stitch between notches.

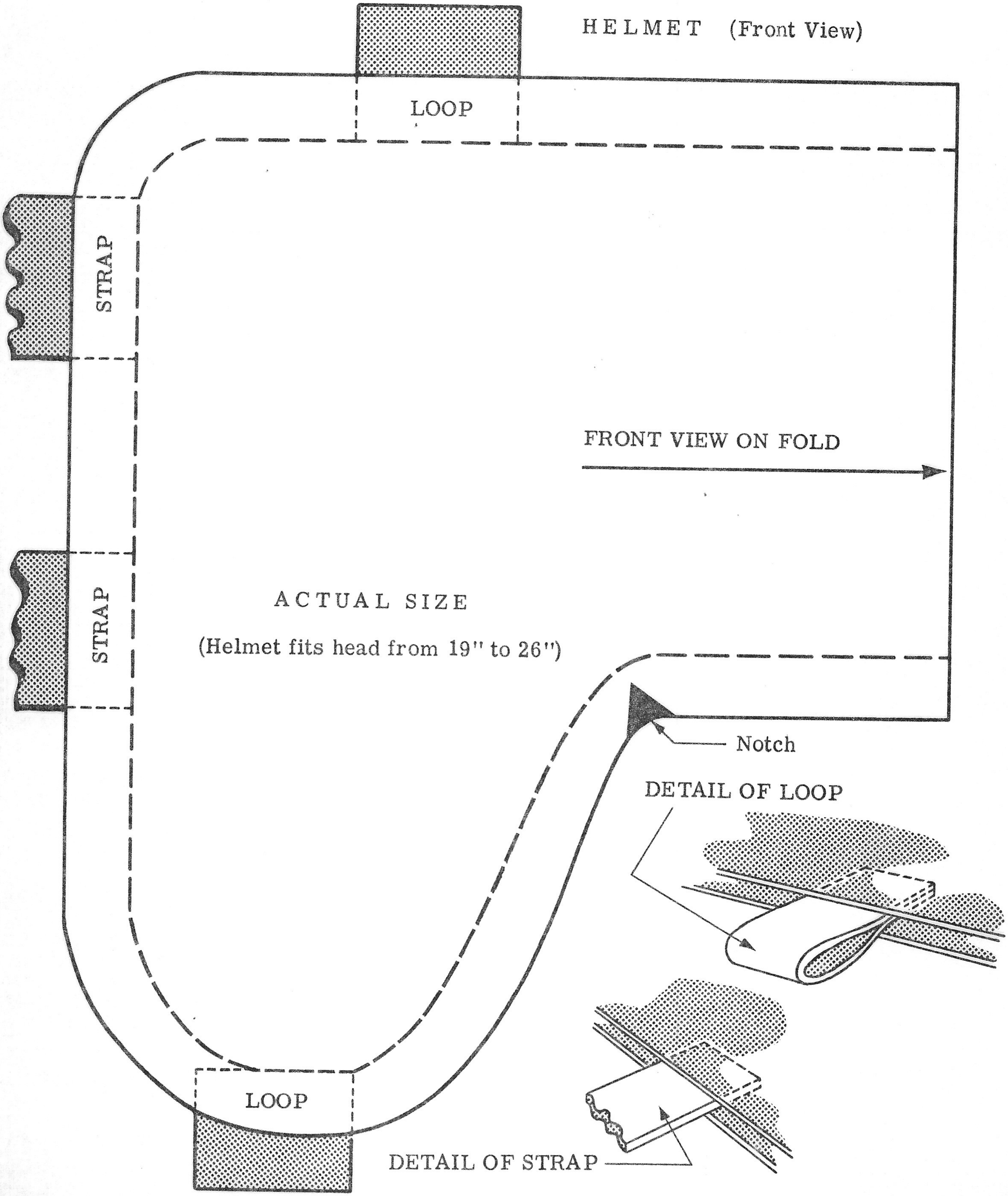
Back (inside):

Do the same process as was done for front, however the two back neck loops should be sewn in when sponge has been added so that the remaining seam allowance can now be top stitched between notches.

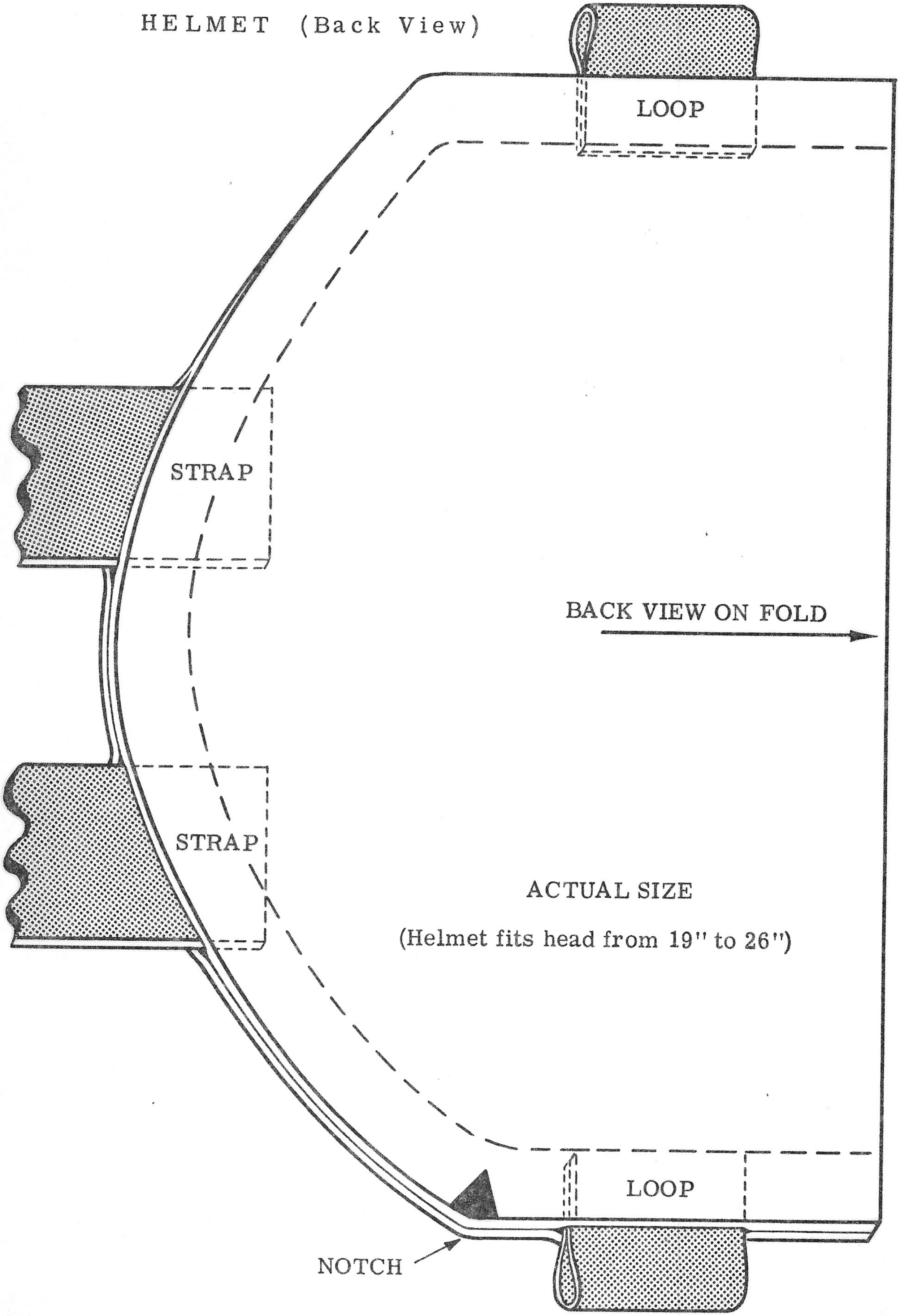
Straps: Cut one 2" x 19" and finish to size 1" x 18".
Cut one 2" x 32" and finish to size 1" x 31".

Fold straps lengthwise, right sides together. Stitch seam. Turn and press. Then turn in end seam allowance and top stitch. Shorter strap placed through upper loops of helmet and tied in bow. Chin strap (longer) placed through lower loops.

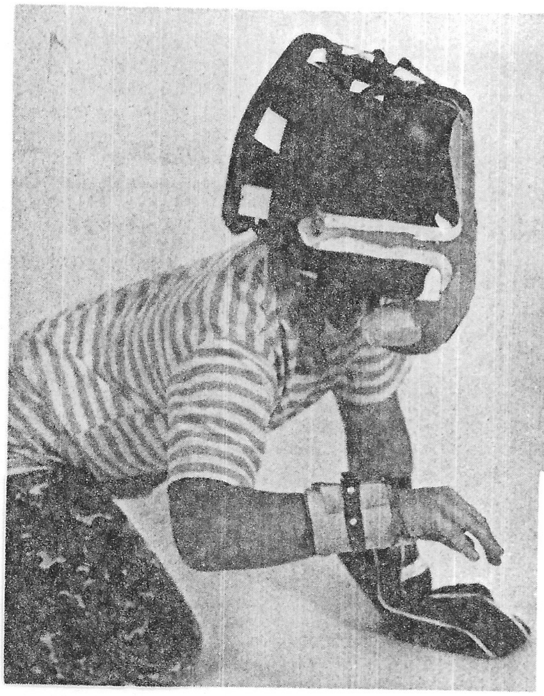
HELMET (Front View)


LOOP
STRAP
STRAP
FRONT VIEW ON FOLD
ACTUAL SIZE
(Helmet fits head from 19" to 26")
Notch
DETAIL OF LOOP
LOOP
DETAIL OF STRAP

HELMET (Back View)

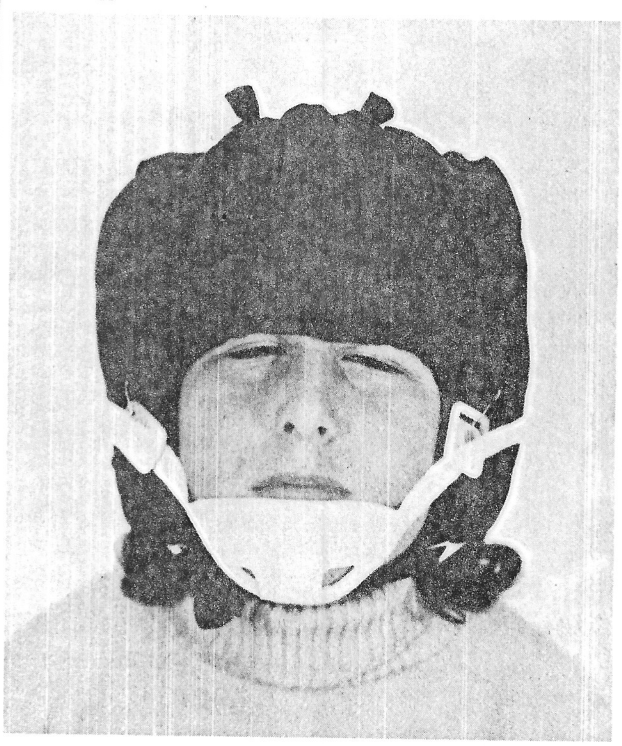

LOOP
STRAP
BACK VIEW ON FOLD
STRAP
ACTUAL SIZE
(Helmet fits head from 19" to 26")
LOOP
NOTCH

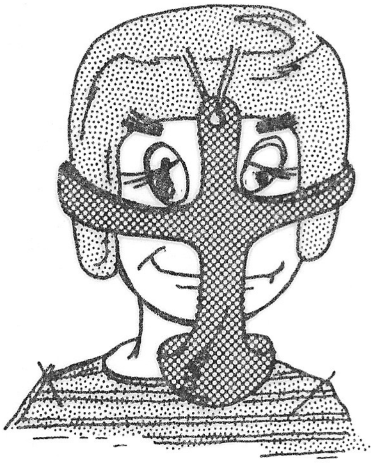
PLASTIC BOTTLE FACE GUARD



1. Plastic bottle face guard.
2. Spoon splint
   neutral wrist
3. Golf mitt to protect fingers
   on sidewalk.

1. Sears & Roebuck football
   chin strap.
2. Sew plastic buckles through
   sponge of helmet.

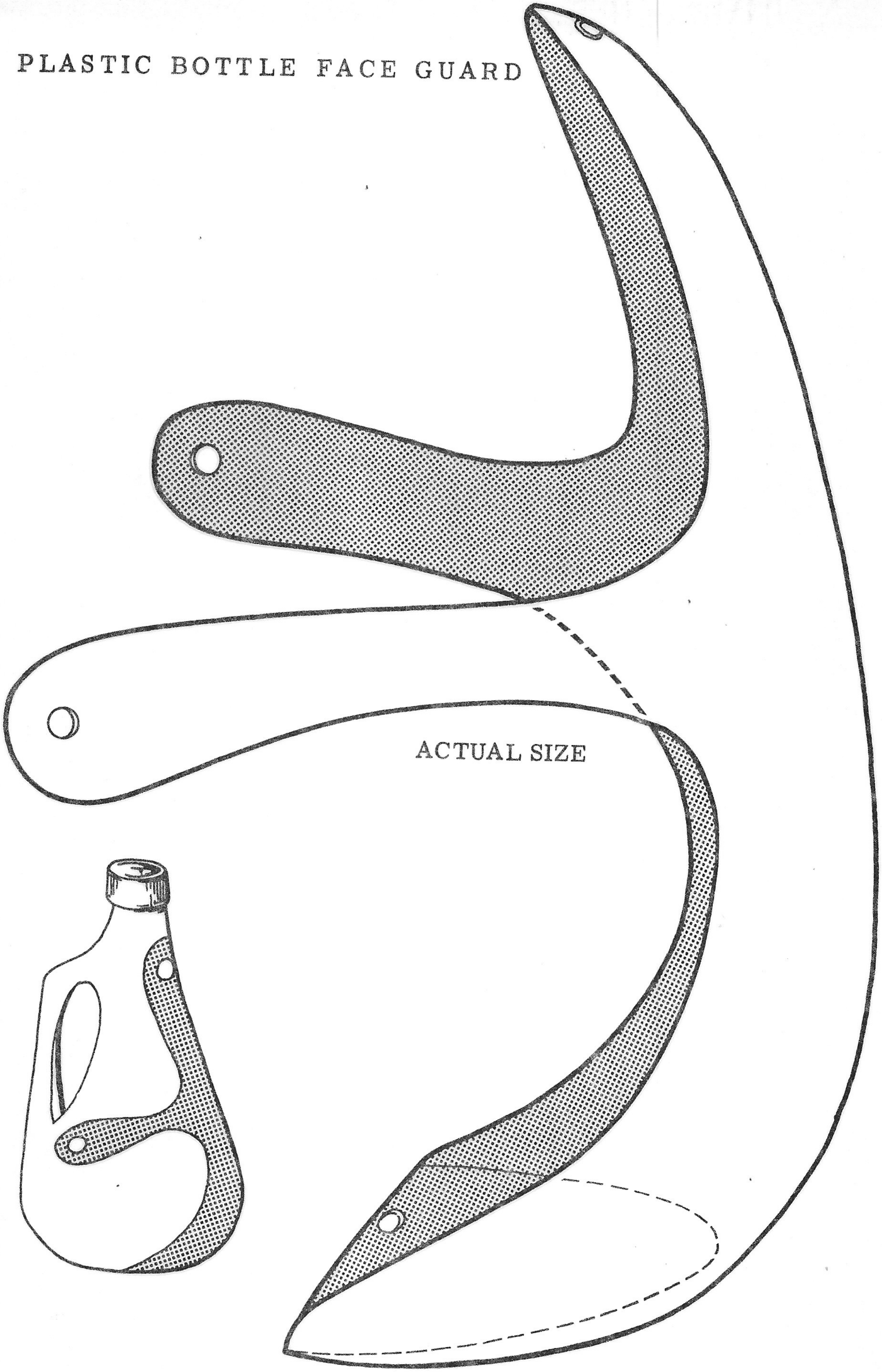




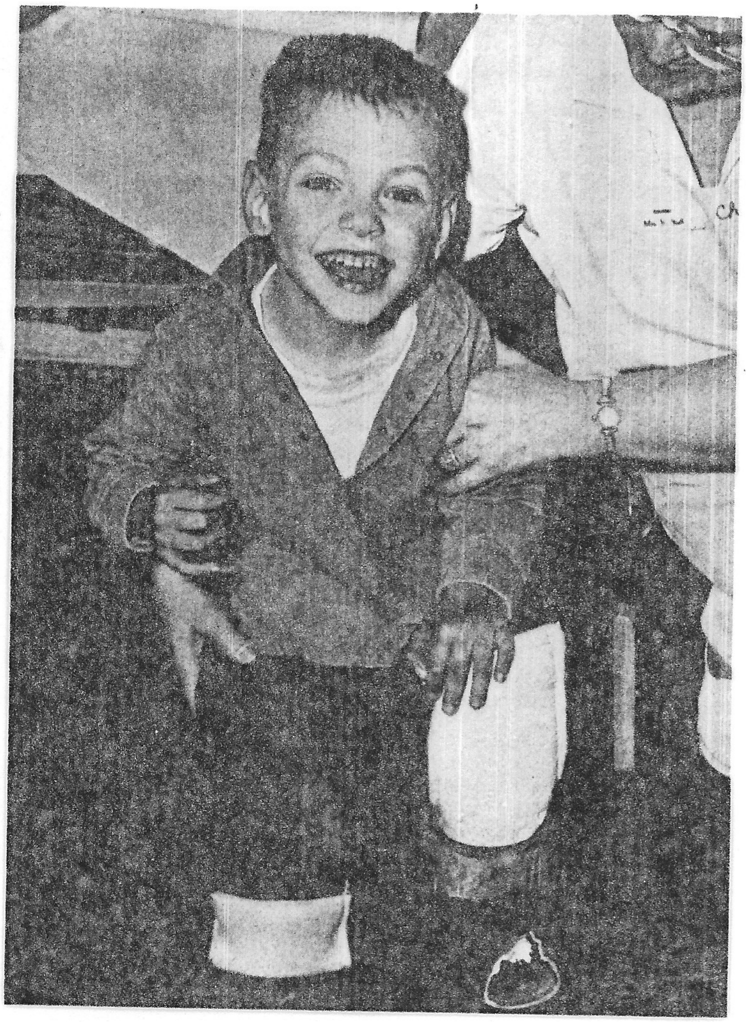
FACE GUARD

1. Select gallon sized oval based bottle.
2. Trace pattern as shown on diagram.
3. Pad with 1" sponge at chin, cover with Scholl's moleskin adhesive backed.
4. Pad with 1/2" sponge on sides.
5. Old leather gloves can be glued over sponge or elk's chamois skin instead of Scholl's.
6. Pierce holes for attaching to helmet (see pattern).
7. Add loop at chin base so helmet neck strap can be threaded (see photo).
8. Barge's rubber cement will hold sponge to plastic, and plastic to leather.

PLASTIC BOTTLE FACE GUARD


ACTUAL SIZE

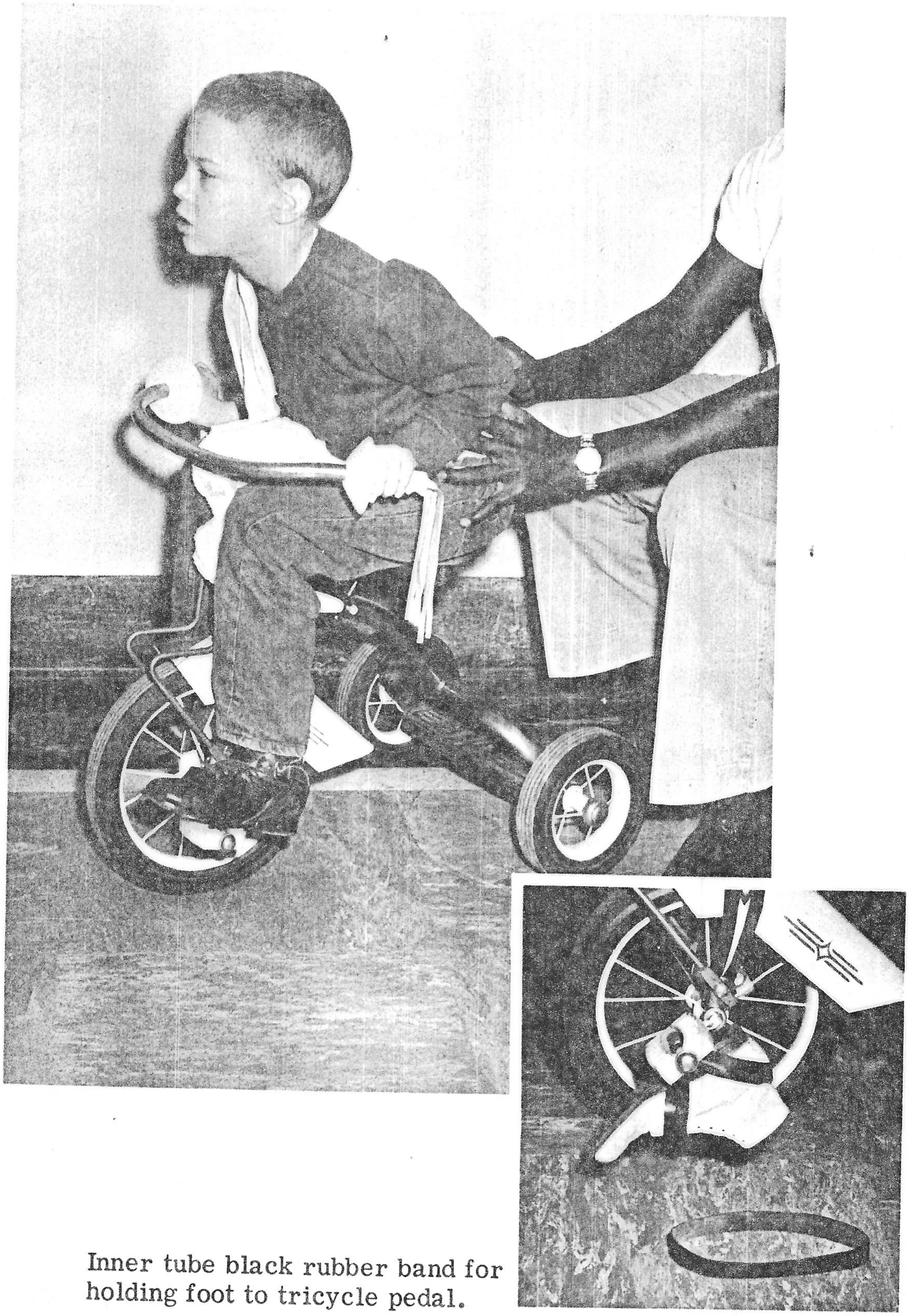
KNEE PADS FOR CRAWLING (For tender knees and to get traction)



1. Use 1/2" thick scrap urethane sponge from car or furniture repair shop. Cut 4 1/2" x 8".
2. Bind with bias or material 1/2" overall.
3. Add 3/4" wide elastic bands (2) by one half circumference of child's knee. Stitch one side to pad; add hooks or velcro to opposite side (for easy applying and removal over knees).
4. Sponge must be uncovered for traction on floor.
5. Urethene sponge can be washed and squeeze towel dried.

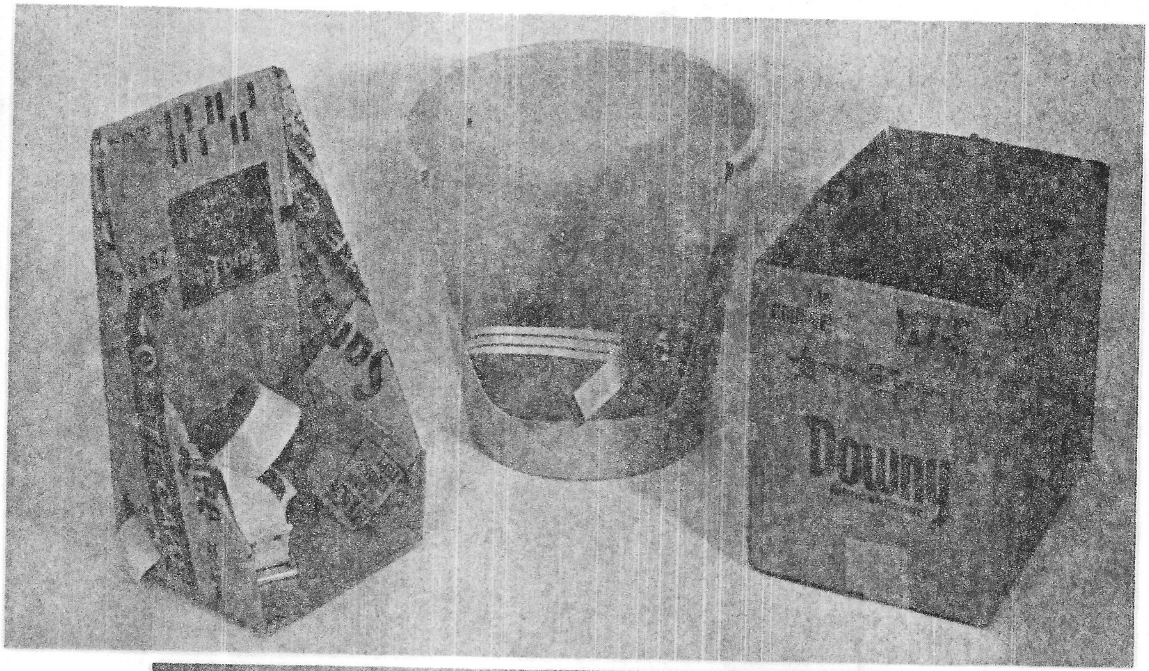
Note: May be used for bed patient's elbows and heels to prevent sheet burns. Fit elastic to limb circumference.

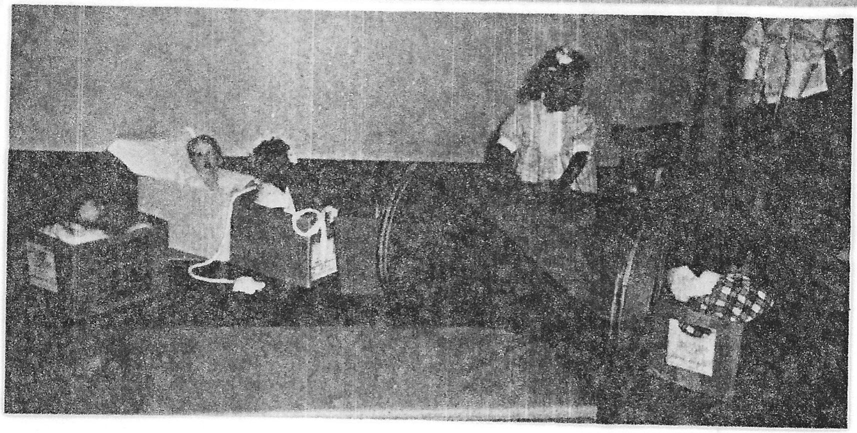
INNER TUBE BLACK RUBBER BAND
FOR HOLDING FOOT TO TRICYCLE PEDAL



Inner tube black rubber band for holding foot to tricycle pedal.

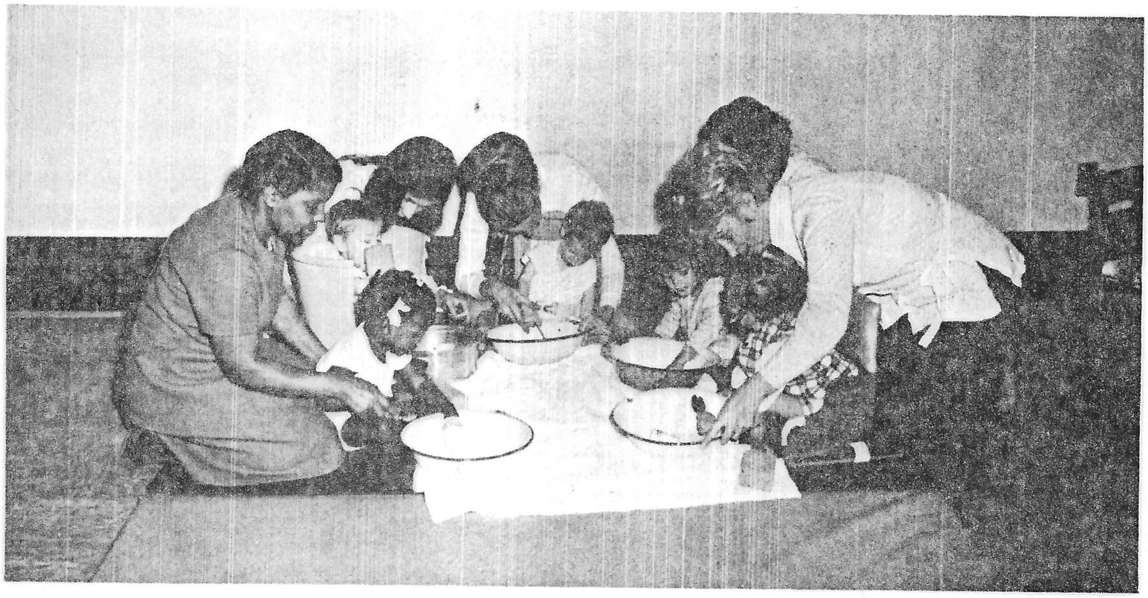
"SIT-UPS"





1. Rectangular cardboard box (glued together), cut and folded to make seat, with seat belt added.
2. Plastic wastebasket (8"diameter base) cut out to make "barrel-back chair" for floor, tub, bed, etc.
   a. Sponge wedge 4" front to 2" back to aid hip flexion for sitting.
   b. Seat belt threads through base of basket.
3. Rectangular box for train rides, etc.
   a. Sensory awarness: space, balance, movement, touch, sound, visual and social contact.
4. Drum tunnel (cardboard from industrial flour, soap, etc.).

BABY "SIT-UPS" (Age 9 months to 26 months)



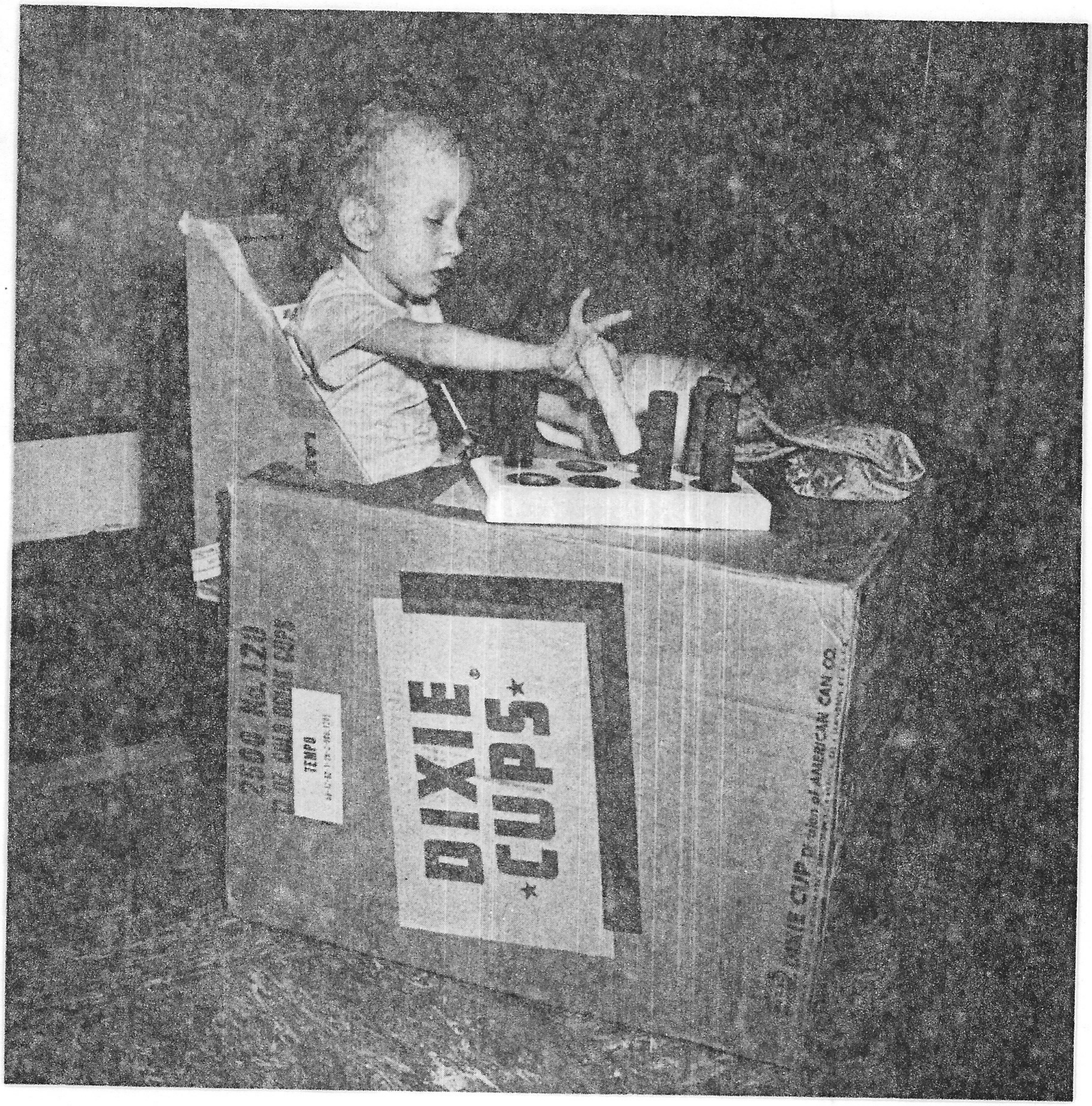
"Sit-ups": Plastic wastebasket
Cardboard box
Plywood (modeled after cardboard box)

Different textures for stimulation: washrags, soap, net balls, water, ice cubes, and towels

"Sit-up" laced on chairs with seat belts for body-trunk support, and to shorten seat depths for little people.

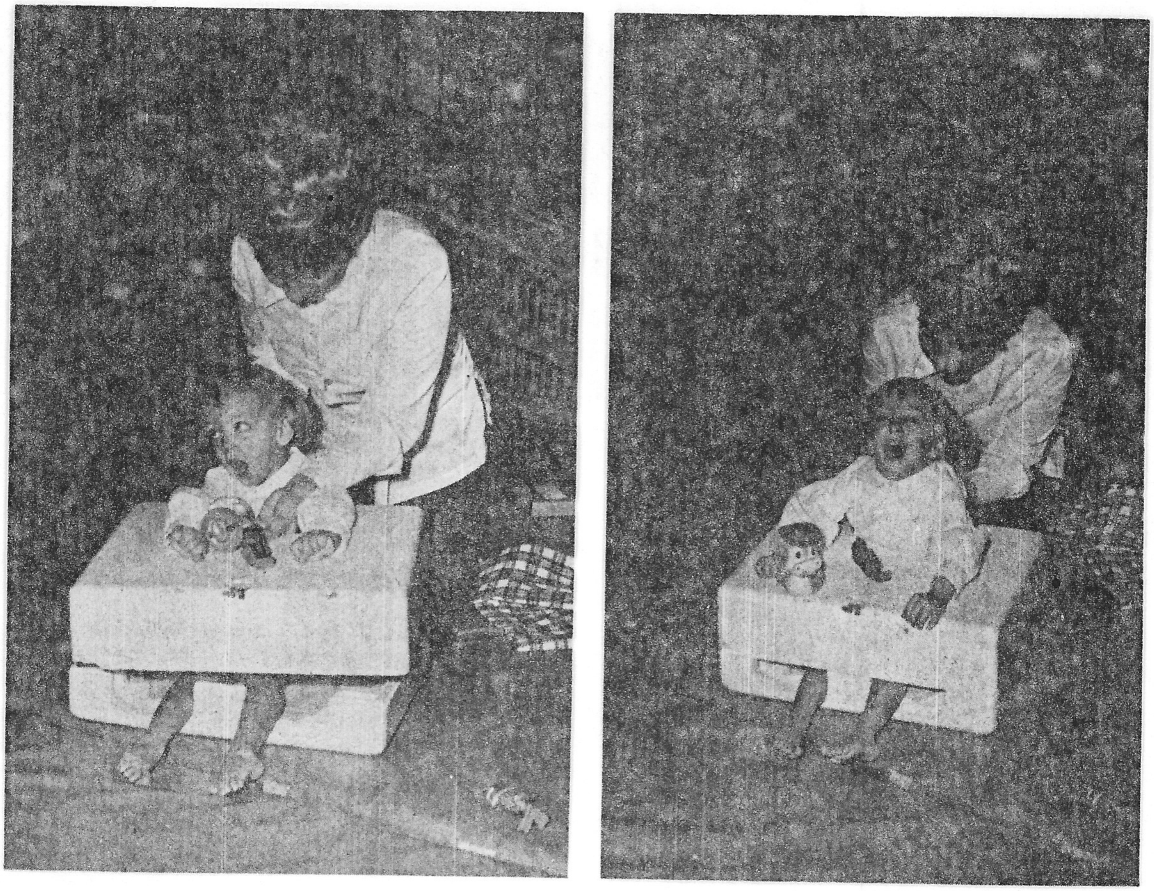
Old hats are used to attract child to mirror image (visual and tactile stimulation). Mirrors are discarded stainless steel cafeteria hot trays with wooden frame added. Cost is 10¢ from Goodwill.

CARDBOARD CHAIR AND TABLE

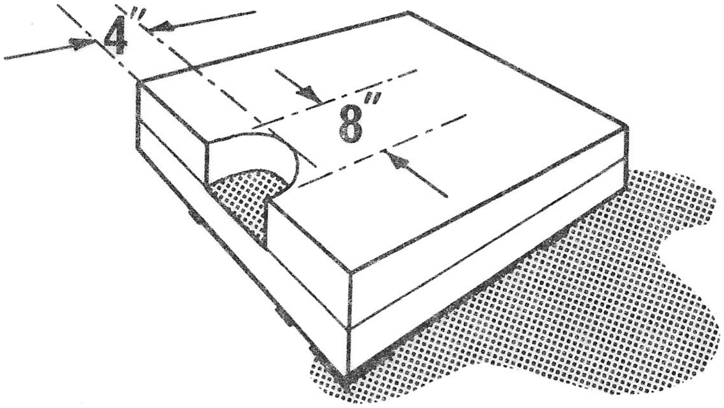

DIXIE CUPS
2500 No. 120
TEMPO
DIXIE CUP Division of AMERICAN CAN CO.

1. Prepare seat from rectangular box 2" wider than child's shoulders (to give lateral side support, if necessary).
2. Thread seat belt through second box (seat base or legs).
   a. Height of base equals child's knee to floor measurement - feet rest flat on floor.
   b. Boxes may be glued together with Elmer's glue.
      a. Weight base of bottom box with sand or bricks (approximately 20 lbs.).
3. Table box measures 2 feet square.
   a. Cut out half circle to fit child.
   b. Table top may be re-inforced with yardstick wood strips on under side, if necessary.
4. Dowel pegs made from window shade rods.

STYROFOAM "SIT-UP TABLE BOX" - THIGH ABDUCTION

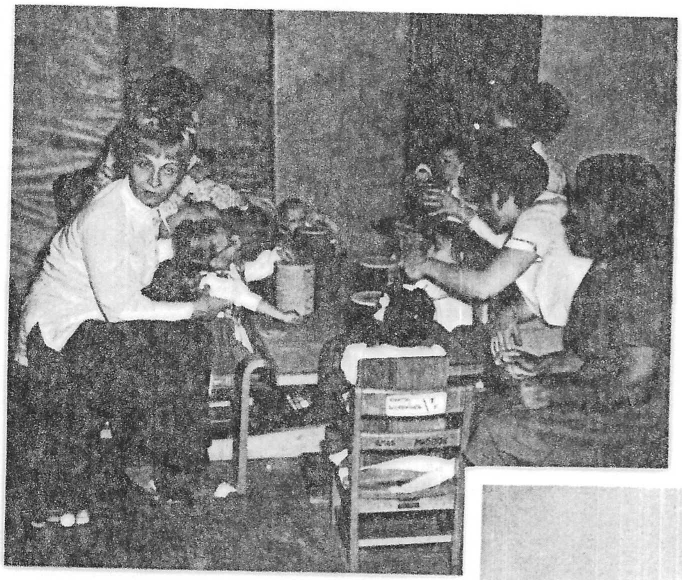


1. Available at office machine dealers, TV stores, etc.
2. Cut leg holes in lower half of box.
3. Measure waist of child, cut half circle by number of diameter inches, i.e.: for 2 or 3 year old.



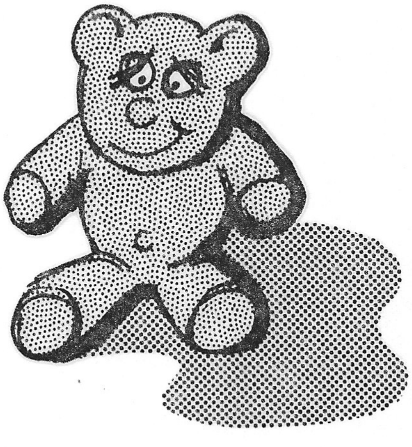
4. Keep box together with elastic strap or belt around entire box.

SCRAPS FOR "TACTILE SENSORY"



Mothers work with babies. Cans are covered with 4 different kinds of material. Child drops in chips, tile, and carpet pieces as they are counted.

Rug scraps, terry cloth stuffed with nylon hose, ice, nylon net cover balls, and corduroy and upholstery material bean bags all feel different.



Leaky wash tub becomes a moving ride.
Stuffed tiger holds up Mark so he can see himself in a stainless steel mirror.
Volunteer assists therapist.